```
Welcome to DIALOG

Dialog level 05.21.01D
? b 411;set files biotech
     25apr08 13:30:49 User219511 Session D722.2
           $0.00   0.117 DialUnits File410
    $0.00  Estimated cost File410
    $0.03  TELNET
    $0.03  Estimated cost this search
    $1.14  Estimated total session cost   0.418 DialUnits
File 411:DIALINDEX(R)

DIALINDEX(R)
  (c) 2008 Dialog

*** DIALINDEX search results display in an abbreviated ***
*** format unless you enter the SET DETAIL ON command. ***
  You have 25 files in your file list.
  (To see banners, use SHOW FILES command)
? s demineralized and bone and (urea or ganidine or guanidium) and ultrafiltration and
heparin and hydroxyapatite

Your SELECT statement is:
  s demineralized and bone and (urea or ganidine or guanidium) and
ultrafiltration and heparin and hydroxyapatite

      Items   File
      -----   ----

  No files have one or more items; file list includes 25 files.

? s demineralized and bone and (urea or guanidine or guanidium) and ultrafiltration and
heparin and hydroxyapatite

Your SELECT statement is:
  s demineralized and bone and (urea or guanidine or guanidium) and
ultrafiltration and heparin and hydroxyapatite

      Items   File
      -----   ----

  No files have one or more items; file list includes 25 files.

? s demineralized and bone and ultrafiltration and heparin and hydroxyapatite

Your SELECT statement is:
  s demineralized and bone and ultrafiltration and heparin and
hydroxyapatite

      Items   File
      -----   ----

  No files have one or more items; file list includes 25 files.

? s demineralized and bone and ultrafiltration and hydroxyapatite

Your SELECT statement is:
  s demineralized and bone and ultrafiltration and hydroxyapatite

      Items   File
      -----   ----

  No files have one or more items; file list includes 25 files.

? s demineralized and bone and hydroxyapatite

Your SELECT statement is:
  s demineralized and bone and hydroxyapatite

      Items   File
      -----   ----
         78    5: Biosis Previews(R)_1926-2008/Apr W3
          2    6: NTIS_1964-2008/Apr W4
         17    8: Ei Compendex(R)_1884-2008/Apr W2
         23   24: CSA Life Sciences Abstracts_1966-2008/Mar
        169   34: SciSearch(R) Cited Ref Sci_1990-2008/Apr W3
         57   45: EMCare_2008/Apr W3
          2   65: Inside Conferences_1993-2008/Apr 25
          6   71: ELSEVIER BIOBASE_1994-2008/Apr W2
         83   73: EMBASE_1974-2008/Apr 25
          1   98: General Sci Abs_1984-2008/Apr
          1   99: Wilson Appl. Sci & Tech Abs_1983-2008/Mar
         12  135: NewsRx Weekly Reports_1995-2008/Apr W4
         11  136: BioEngineering Abstracts_1966-2007/Jan
         20  144: Pascal_1973-2008/Apr W3
        122  155: MEDLINE(R)_1950-2008/Apr 24
          1  172: EMBASE Alert_2008/Apr 25
          1  266: FEDRIP_2008/Feb
         12  357: Derwent Biotech Res.__1982-2008/Mar W3
         15  399: CA SEARCH(R)_1967-2007/UD=14817
         27  434: SciSearch(R) Cited Ref Sci_1974-1989/Dec

  20 files have one or more items; file list includes 25 files.

? s demineralized and bone and (purif? or isolat?)

Your SELECT statement is:
  s demineralized and bone and (purif? or isolat?)

      Items   File
      -----   ----
        140    5: Biosis Previews(R)_1926-2008/Apr W3
          1    6: NTIS_1964-2008/Apr W4
         11    8: Ei Compendex(R)_1884-2008/Apr W2
         68   24: CSA Life Sciences Abstracts_1966-2008/Mar
        151   34: SciSearch(R) Cited Ref Sci_1990-2008/Apr W3
         37   45: EMCare_2008/Apr W3
          1   65: Inside Conferences_1993-2008/Apr 25
         17   71: ELSEVIER BIOBASE_1994-2008/Apr W2
        130   73: EMBASE_1974-2008/Apr 25
          1   99: Wilson Appl. Sci & Tech Abs_1983-2008/Mar
         16  135: NewsRx Weekly Reports_1995-2008/Apr W4
          8  136: BioEngineering Abstracts_1966-2007/Jan
         37  144: Pascal_1973-2008/Apr W3
        201  155: MEDLINE(R)_1950-2008/Apr 24
          3  266: FEDRIP_2008/Feb
         12  357: Derwent Biotech Res.__1982-2008/Mar W3
          1  370: Science_1996-1999/Jul W3
         14  399: CA SEARCH(R)_1967-2007/UD=14817
         31  434: SciSearch(R) Cited Ref Sci_1974-1989/Dec

  19 files have one or more items; file list includes 25 files.

? save temp; b 155,5,71,73;exs;rd
Temp SearchSave "TF551602140" stored
     25apr08 13:33:52 User219511 Session D722.3
          $8.37   2.845 DialUnits File411
    $8.37  Estimated cost File411
    $1.06  TELNET
    $9.43  Estimated cost this search
   $10.57  Estimated total session cost   3.264 DialUnits

SYSTEM:OS - DIALOG OneSearch
  File 155:MEDLINE(R) 1950-2008/Apr 24
       (c) format only 2008 Dialog
*File 155: MEDLINE has reloaded. Please see HELP NEWS 155
for details.
  File   5:Biosis Previews(R) 1926-2008/Apr W3
       (c) 2008 The Thomson Corporation
  File  71:ELSEVIER BIOBASE 1994-2008/Apr W2
```

(c) 2006 Elsevier B.V.
File 73:EMBASE 1974-2006/Apr 25
(c) 2006 Elsevier B.V.
*File 73: The 2006 EMTREE Thesaurus has been loaded. Please see HELP NEWS 72 for details.

Set Items Description
--- ----- -----------
Executing TF551602140
6648 DEMINERALIZED
1508661 BONE
1529692 PURIF?
3199290 ISOLAT?
S1 488 DEMINERALIZED AND BONE AND (PURIF? OR ISOLAT?)
S2 261 RD (unique items)
? t s2/7/1-261

2/7/1 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

25719238 PMID: 18091668
Regenerative periodontal therapy in intrabony defects: state of the art.
Cortellini P; Labriola A; Tonetti M S
Accademia Toscana di Ricerca Odontostomatologica , Florence, Italy. studiocortellini@cortellini.191.it
Minerva stomatologica (Italy) Oct 2007, 56 (10) p519-39, ISSN 0026-4970--Print Journal Code: 0421071
Publishing Model:Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: In Process
Many scientific data show that periodontal regeneration is an effective and predictable procedure for the treatment of %%%isolated%%% and multiple intrabony defects. Meta-analyses from systematic reviews show a clinical advantage in terms of clinical attachment level gain when %%%demineralized%%% freeze dried %%%bone%%% allograft, barrier membranes and amelogenins are applied in comparison with open flap debridement alone. On the other hand, a consistent amount of variability of the outcomes is evident among different studies and within the experimental population of the same study. This variability is explained, at least in part, by the different patient and defect characteristics and by a different degree of skill of the surgeon. Patient-related factors are smoking habit, compliance with home oral hygiene and residual inflammation after cause-related therapy. Defect-associated factors include defect depth and Rx angle, number of residual bony walls, pocket depth, and the degree of hypermobility. Surgical skill and experience to manipulate the delicate papilla preservation techniques is required along with the knowledge of indication and limits of the different regenerative materials. A strategy to optimise the surgical design of the flap, the use of the regenerative materials according to their characteristics, and the application of passive sutures is presented in this review, along with the foundation of the scientific background.
Record Date Created: 20071219

2/7/2 (Item 2 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

25187851 PMID: 17990438
Clinical results using recombinant human platelet-derived growth factor and mineralized freeze-dried %%%bone%%% allograft in periodontal defects.
Nevins Myron, Hanratty James, Lynch Samuel E
Department of Continuing Education, Harvard University School of Dental Medicine, Boston, Massachusetts, USA.
International journal of periodontics & restorative dentistry (United States) Oct 2007, 27 (5) p421-7, ISSN 0198-7569--Print Journal Code: 8200894
Publishing Model:Print
Document type: Case Reports; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Human studies have demonstrated the safety and effectiveness of highly %%%purified%%% recombinant human platelet-derived growth factor-BB (rhPDGF-BB) in combination with osteoconductive matrices for the treatment of moderate to severe periodontal intrabony defects. These study results, together with binding and release characteristics for rhPDGF-BB with different matrices, provide clear evidence that %%%demineralized%%% freeze-dried %%%bone%%% allograft and beta-tricalcium phosphate (beta-TCP) each can be combined with rhPDGF-BB to promote significant improvements in clinical, radiographic, and histologic parameters. The purpose of the current case series was to determine the clinical and radiographic regenerative potential of rhPDGF-BB-enhanced mineralized freeze-dried %%%bone%%% allograft (FDBA) for the treatment of severe periodontal intrabony defects. Clinical reentry and radiographs at up to 11 months showed complete %%%bone%%% fill in these challenging cases, indicating that rhPDGF combined with FDBA provides excellent clinical results.
Record Date Created: 20071109
Record Date Completed: 20071206

2/7/3 (Item 3 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

25097246 PMID: 17961368
[Effect of platelet rich plasma on vascularization of tissue-engineered %%%bone%%%]
Li Ning-Yi; Chen Li-Qiang; Chen Tao; Jin Xiao-Ming; Yuan Rong-Tao
Department of Oral and Maxillofacial Surgery, The Affiliated Hospital of Medical College, Qingdao University, Qingdao Shandong 266003, China. ningyili342@163.com
Zhonghua kou qiang yi xue za zhi = Zhonghua kouqiang yixue zazhi = Chinese journal of stomatology (China) Jul 2007, 42 (7) p436-7, ISSN 1002-0098--Print Journal Code: 8711066
Publishing Model:Print
Document type: English Abstract; Journal Article
Languages: CHINESE
Main Citation Owner: NLM
Record type: In Process
OBJECTIVE: To study the effects of platelet rich plasma (PRP) on vascularization of tissue-engineered %%%bone%%%. METHODS: %%%Bone%%% marrow stromal cell (BMSC) were %%%isolated%%% from iliac %%%bone%%% of dogs. PRP was obtained from the same dog and %%%demineralized%%% %%%bone%%% matrix (DBM) was prepared from homologous %%%bone%%%. Twelve dogs were divided into three groups and the back of each dog was divided into four areas. The DBM- BMSC- PRP was implanted in the area A and B; the DBM-BMSC without PRP was implanted in the area C and D. The implants in the areas A and C were wrapped using myo-fascia with blood vessel of latissimus dorsi. The implants in the area B and D were wrapped using superficial fascia of the back without blood vessel. The implants were taken out 4, 8 and 12 weeks later for examination. RESULTS: The degree of calcification and blood vessel formation of the implants was A > B > C > D. CONCLUSIONS: Both PRP and vessels of latissimus dorsi muscle could promote calcification and vascularization in tissue-engineered %%%bone%%%, when used separately or in combination.
Record Date Created: 20071026

2/7/4 (Item 4 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

25047560 PMID: 17896505
[Effect of platelet-rich plasma and latissimus dorsi myofascia with blood vessel on vascularization of tissue engineered %%%bone%%% in dogs]

Li Ning-yi, Chen Li-qiang, Chen Tao, Jin Xiao-ming, Yuan Rong-tao
Dept. of Oral and Maxillofacial Surgery, The Affiliated Hospital of Medical College, College of Stomatology, Qingdao University, Qingdao 266003, China.
Hua xi kou qiang yi xue za zhi = Huaxi kouqiang yixue zazhi = West China journal of stomatology (China) Aug 2007, 25 (4) p408-11, ISSN 1000-1182--Print Journal Code: 9422648
Publishing Model Print
Document type: English Abstract; Journal Article
Languages: CHINESE
Main Citation Owner: NLM
Record type: In Process
OBJECTIVE: To study the effect of platelet-rich plasma (PRP) and latissimus dorsi myofascia with blood vessel on vascularization of tissue engineered %%%bone%%% in dogs. METHODS: %%%Bone%%% marrow stromal cells (BMSCs) were %%%isolated%%% from iliac %%%bone%%% of dogs. PRP was obtained from the same dog. And %%%demineralized%%% %%%bone%%% matrix (DBM) were prepared from homologuous %%%bone%%%. ABCD 4 areas were divided on the back of dog. PRP/BMSCs/DBM was implanted around the vessels of latissimus dorsi muscle in the A. PRP/BMSCs/DBM wrapped by superficial fascia in the B. BMSCs/DBM was implanted around vessels of latissimus dorsi muscle in the C. BMSCs/DBM wrapped by superficial fascia in the D area of the same dog. 4, 8, 12 weeks after implantation, gross specimen and histology examination were made. RESULTS: Osteogenesis and blood vessel formation results were A>B>C>D area. CONCLUSION: The results suggested that the PRP and latissimus dorsi myofascia with blood vessels could promote calcification and vascularization in tissue-engineered %%%bone%%%.
Record Date Created: 20070927

2/7/5 (Item 5 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

24935392 PMID: 17285993
[Repair alveolar cleft %%%bone%%% defects with %%%bone%%% marrow stromal cells]
Chai Gang; Zhang Yan; Hu Xiao-jie; Wang Min; Liu Wei; Cui Lei; Cao Yi-lin
Department of Plastic and Reconstructive Surgery, Ninth People's Hospital, Shanghai Second Medical University, Shanghai Tissue Engineering Center, Shanghai 200011, China.
Zhonghua zheng xing wai ke za zhi = Zhonghua zhengxing waike zazhi = Chinese journal of plastic surgery (China) Nov 2006, 22 (6) p409-11, ISSN 1009-4598--Print Journal Code: 100957850
Publishing Model Print
Document type: English Abstract; Journal Article
Languages: CHINESE
Main Citation Owner: NLM
Record type: In Process
OBJECTIVE: To explore the feasibility of repairing alveolar cleft %%%bone%%% defects with %%%bone%%% marrow stromal cells. METHODS: Total 7 patients of alveolar cleft were included in this study. The hBMSCs were %%%isolated%%% by percoll gradient centrifugation from patient's %%%bone%%% marrow aspirated from iliac crest. The hBMSCs were cultured in vitro and induced to become osteogenic cells in the DMEM medium containing 10% self-serum, beta-glycerophosphate (10 nmol/L) dexamethasone (10(-8) mol/L), L-2-ascorbic acid(50 micromol/L), and 1, 25 (OH)2 VD3 (10 nmol/L). Induced hBMSCs of passage 3 were harvested and seeded onto partly %%%demineralized%%% allogenic %%%bone%%% matrix (pDBM) to form a cell-scaffold construct and in vitro co-culture for 1 week. The defects were repaired with the cell-scaffold construct. All cases were followed up for 3, 6 months post-operation as short-term evaluation and 1 to 3 years post-operation as long-term evaluation by three-dimensional computerized tomography (3D-CT) and clinical examination. RESULTS: 3D-CT demonstrated that engineered %%%bone%%% was formed in 3 months post-operation. Additionally, formed %%%bone%%% maintained stable up to 1 - 3 years without absorption. CONCLUSIONS: Engineered %%%bone%%% can be used to repair clinical alveolar cleft %%%bone%%% defects.
Record Date Created: 20070208

2/7/6 (Item 6 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

17722788 PMID: 17557264
Urine release of systemically administered %%%bone%%% morphogenetic protein hybrid molecule.
Grgurevic Lovorka; Macek Boris; Erjavec Igor; Mann Matthias; Vukicevic Slobodan
Laboratory of Mineralized Tissues, School of Medicine, University of Zagreb, Zagreb - Croatia.
Journal of nephrology (Italy) May-Jun 2007, 20 (3) p311-9, ISSN 1121-8428--Print Journal Code: 9012266
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
BACKGROUND: Although it is well known that TGF-beta circulates, the presence and activity of endogenous %%%bone%%% morphogenetic proteins (BMPs) in biological fluids has not been studied. Here we investigated the urine secretion of a systemically administered BMP hybrid molecule. METHODS: A dimeric recombinant human BMP molecule consisting of the BMP-7 prodomain and the BMP-6 mature domain was constructed and injected into Sprague Dawley rats. The blood was collected from the rats' orbital plexus, and 24-hour urine samples were pooled and %%%purified%%% using a heparin sepharose column. Protein identity was confirmed by Western blot and by liquid chromatography-mass spectrometry (LC-MS) of the resulting peptides. Urine-derived protein from the 35-kDa band was bound to inactive %%%demineralized%%% %%%bone%%% matrix and implanted subcutaneously into rats. RESULTS: Western blot analysis of sera demonstrated that BMP-7/6 remained intact in the rat plasma and could still be visualized 30 minutes after its systemic administration. Two protein bands at 35 and 39 kDa were detected with anti-BMP antibodies in the urine of rats, corresponding to the mature active BMP-6 dimer and the prodomain of BMP-7, respectively. LC-MS analysis detected only peptides derived from the BMP-7/6 molecule. Histological analysis of implanted pellets revealed formation of a new endochondral %%%bone%%% 14 days following implantation. CONCLUSIONS: These results show for the first time that systemically administered BMP-7/6 hybrid molecule is secreted into the urine and that its biological activity is preserved, suggesting that analysis of BMP in urine might reflect its presence in serum.
Record Date Created: 20070608
Record Date Completed: 20071029

2/7/7 (Item 7 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

17709796 PMID: 17488005
Method development of efficient protein extraction in %%%bone%%% tissue for proteome analysis.
Jiang Xiaogang; Ye Mingliang; Jiang Xinning; Liu Guangpeng; Feng Shun; Cui Lei; Zou Hanfa
National Chromatographic R&A Center, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian 116023, China.
Journal of proteome research (United States) Jun 2007, 6 (6) p2257-64, ISSN 1535-3893--Print Journal Code: 101128775
Publishing Model Print-Electronic; Comment in J Proteome Res. 2007 Jun;6(6) 2053; Comment in PMID 17577953
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Exploring %%%bone%%% proteome is an important and challenging task for understanding the mechanisms of physiological/pathological process of %%%bone%%% tissue. However, classical methods of protein extraction for soft tissues and cells are not applicable for %%%bone%%% tissue. Therefore,

method development of efficient protein extraction is critical for %%%bone%%% proteome analysis. We found in this study that the protein extraction efficiency was improved significantly when %%%bone%%% tissue was %%%demineralized%%% by hydrochloric acid (HCl). A sequential protein extraction method was developed for large-scale proteome analysis of %%%bone%%% tissue. The %%%bone%%% tissue was first %%%demineralized%%% by
HCl solution and then extracted using three different lysis buffers. As large amounts of acid soluble proteins also presented in the HCl solution, besides collection of proteins in the extracted lysis buffers, the proteins in the %%%demineralized%%% HCl solution were also collected for proteome analysis. Automated 2D-LC-MS/MS analysis of the collected protein fractions resulted in the identification of 6202 unique peptides which matched 2479 unique proteins. The identified proteins revealed a broad diversity in the protein identity and function. More than 40 %%%bone%%%-specific proteins and 15 potential protein biomarkers previously reported were observed in this study. It was demonstrated that the developed extraction method of proteins in %%%bone%%% tissue, which was also the first large-scale proteomic study of %%%bone%%%, was very efficient for comprehensive analysis of %%%bone%%% proteome and might be helpful for clarifying the mechanisms of %%%bone%%% diseases.
Record Date Created: 20070601
Record Date Completed: 20070718
Date of Electronic Publication: 20070508

2/7/8 (Item 8 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

17694682 PMID: 17519723
The role of functional orthodontic stress on implants in residual alveolar cleft.
Giudice Giuseppe; Gozzo Giuseppe; Sportelli Pasquale; Gargiuoli Florinda; De State Apollonia
Department of Plastic and Reconstructive Surgery, Faculty of Medicine, University of Bari, Bari, Italy. g.giudice@dacti.uniba.it
Plastic and reconstructive surgery (United States) Jun 2007, 119 (7) p2206-17, ISSN 1529-4242--Electronic Journal Code: 1306050
Publishing Model Print
Document type: Comparative Study; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
BACKGROUND: The most widely accepted protocol for alveolar cleft reconstruction is repair during the mixed dentition stage (age, 9 to 11 years), before eruption of the canine teeth. Alveolar %%%bone%%% grafting should not be considered as an %%%isolated%%% therapy but always as an integrated part of comprehensive orthodontic treatment. METHODS: The authors evaluate the results of transitional secondary osteoplasty, comparing the use of autogenous cancellous %%%bone%%% versus heterogenetic implants, in patients with unilateral complete clefts who did or did not undergo orthodontic treatment. From 1990 to 1994, 48 patients aged between 9 and 11 years with unilateral alveolar cleft underwent alveolar grafting by transitional secondary osteoplasty. In 30 patients (group A), autogenous cancellous %%%bone%%% was used, and in 18 patients (group B), a heterogenetic implant consisting of %%%demineralized%%% %%%bone%%% powder containing %%%bone%%% morphogenetic protein and hydroxylapatite was used. RESULTS: Twenty-two patients in group A and 12 patients in group B underwent orthodontic treatment. After 10 to 12 years of follow-up, the clinical and radiographic examinations revealed that the best alveolar %%%bone%%% repair results were obtained using autologous %%%bone%%% graft in association with orthodontic treatment. Also, in the patients who underwent heterogenetic implantation, the orthodontic treatment clearly improved the quality of the osteoplasty. CONCLUSIONS: The essential conditions for a successful osteoplasty include meticulous operative technique and orthodontic treatment. The latter plays an essential role at several stages of development in children with clefts. The "functional stress" on the autologous or heterogenetic implant exerts a decisive influence on the quality and volume of the osteoplasty, preventing progressive resorption.
Record Date Created: 20070523
Record Date Completed: 20070604

2/7/9 (Item 9 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

17638420 PMID: 17450839
Preparation and characterization of hydroxyapatite/collagen nanocomposite gel.
Yunoki Shunji; Ikoma Toshiyuki; Monkawa Akira; Ohta Kazushi; Tanaka Junzo
National Institute for Materials Science, Namiki 1-1, Tsukuba, Ibaraki 305-0044, Japan.
Journal of nanoscience and nanotechnology (United States) Mar 2007, 7 (3) p818-21, ISSN 1533-4880--Print Journal Code: 101088195
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The self-organized hydroxyapatite/collagen (HAp/Col) nanocomposite fiber (79.6/20.4 weight ratio) was synthesized by a co-precipitation method using Ca(OH)2, H3PO4, and Col as starting substances. The gelation of the nanocomposite is essential in the application of the scaffold for %%%bone%%% tissue engineering. We successfully prepared HAp/Col nanocomposite gels by a facile novel method using a sodium phosphate buffer at pH 6.8. The water-insoluble nanocomposite was homogeneously dispersed in the buffer to form a viscous mixture, and gels were obtained after incubating of the mixture at 37 degrees C. The mechanical strength of the gels was analyzed against the incubation time. The %%%demineralized%%% gel with EDTA had the typical nanostructure of native type I Col fibers from the results of scanning electron microscopy (SEM) and atomic force microscopy (AFM); the dense network of type I Col nano-fibers below 100 nm in diameter, and the periodic pattern of 68.84.4 nm (mean SD) along the fibers were observed. The gelation of the HAp/Col nanocomposite in the buffer is attributed to the physical cross-linking through entanglement of the reconstituted Col fibrils.
Record Date Created: 20070424
Record Date Completed: 20070522

2/7/10 (Item 10 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

17468791 PMID: 17718287
Effects of %%%demineralized%%% %%%bone%%% matrix on proliferation and osteogenic differentiation of mesenchymal stem cells from human umbilical cord.
Honsawek Sittisak; Dhitseith Dhakoon; Phupong Vorapong
Department of Biochemistry, Faculty of Medicine, Chulalongkorn University and Hospital, Rama IV Rd, Patumwan, Bangkok 10330, Thailand. fmedshs@md.chula.ac.th
Journal of the Medical Association of Thailand = Chotmaihet thangphaet (Thailand) Sep 2006, 89 Suppl 3 pS189-95, ISSN 0125-2208--Print
Journal Code: 7507216
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
BACKGROUND: Mesenchymal stem cells or mesenchymal progenitor cells are defined as self-renewable, multipotent progenitor cells with the unlimited capacity to differentiate into multiple lineage-specific cells that form %%%bone%%%, cartilage, fat, and muscle tissues. %%%Demineralized%%% %%%bone%%% matrix (DBM) has been extensively utilized in orthopaedic, periodontal, and maxillofacial applications and widely investigated as a biomaterial to promote new %%%bone%%% formation. OBJECTIVE: To

%%%isolate%%% and characterize umbilical cord mesenchymal stem (UCMS) cells and examine the biological activity of DBM in the UCMS cells MATERIAL AND METHOD. UCMS cells were obtained from human umbilical cord culture. Cells were treated with or without DBM over 7 days of culture. Cell proliferation was examined by direct cell counting. Osteogenic differentiation of the UCMS cells was analysed with alkaline phosphatase staining assay. RESULTS: Phenotypic characteristics ofhuman UCMS cells were spindle and stellate shapes with fine homogenous cytoplasm, typically associated with fibroblast-like cells. The control cells (without DBM treatment) exhibited a spindle shape with little extracellular matrix, whereas the DBM treated cells appeared shortened and flattened, and they were surrounded by extracellular matrix. DBM inhibited the growth of the UCMS cells by 50% as determined by direct cell counting. Morphologic and histochemical studies confirmed that DBM had a strong stimulatory effect on the alkaline phosphatase activities of UCMS cells, a very early marker of cell differentiation into the osteogenic lineage. CONCLUSION: Mesenchymal progenitor cells derived from umbilical cord could differentiate along an osteogenic lineage and thus provide an alternative source for cell-based therapies and tissue engineering strategies.
Record Date Created: 20070827
Record Date Completed: 20070927

2/7/11 (Item 11 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

17267552 PMID: 17003622
Closure of rabbit calvarial critical-sized defects using protective composite allogeneic and alloplastic %%%bone%%% substitutes.
Haddad Albert J; Peel Sean A F; Clokie Cameron M L; Sandor George K B
Orthobiologics Laboratory and Oral and Maxillofacial Surgery, University of Toronto, Toronto, Ontario, Canada. george.sandor@utoronto.ca
Journal of craniofacial surgery (United States) Sep 2006, 17 (5) p928-34, ISSN 1049-2275--Print Journal Code: 9010410
Publishing Model:Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
This study evaluated the repair of critical-sized cranial vault defects in thirty New Zealand white rabbits using various allogeneic and alloplastic %%%bone%%% substitutes designed to provide mechanical protection to the brain as well as osteoinductivity. The strategies employed included %%%demineralized%%% %%%bone%%% matrix (DBM), a putty used in combination with a rigid resorbable plating system as a protective covering and calcium phosphate cement (CPC) combined with native partially %%%purified%%% %%%bone%%% morphogenetic protein (BMP). Bilateral critical-sized defects measuring 15 mm in diameter were created in the parietal bones of 30 adult male New Zealand white rabbits. They were divided into three groups with ten animals in each. Group 1 had one defect left unfilled as a control while autogenous %%%bone%%% was placed in the defect on the other side. In Group 2 a rigid resorbable copolymer membrane, Lactosorb (Lorenz Surgical, Jacksonville, Florida), was placed over both defects to cover them and protect the underlying tissues. The pericranial aspect of one defect was left unfilled while the other defect was filled with DBM putty. Group 3 had a CPC, Mimix (Lorenz Surgical, Jacksonville, Florida), placed into one of the defects while the defect on the other side was filled with the same CPC in combination with BMP in a concentration of 25 mg/mL. %%%Bone%%% healing was assessed clinically, radiographically, and histomorphometrically. All unfilled controlled defects, the defects covered with the resorbable Lactosorb membrane and those filled with calcium phosphate cement alone, healed with a fibrous scar. Defects reconstructed with DBM putty in combination with the resorbable Lactosorb membrane and calcium phosphate in combination with BMP healed with %%%bone%%% bridging the entire defect. This was obvious radiographically where the defects appeared completely filled with a dense radiopaque tissue. Histological analyses demonstrated that specimens where DBM putty was used in combination with the resorbable Lactosorb membrane had 67.7% new %%%bone%%% fill at 6 weeks and 84.0% at 12 weeks. Resorption of DBM particles was evidenced by the presence of osteoclastic activity and by the significant decrease in the size of the %%%demineralized%%% %%%bone%%% particles. In the calcium phosphate groups where BMP was added to the bioimplant there was 45.8% new %%%bone%%% formation at 12 weeks. The utilization of a composite consisting of DBM with resorbable Lactosorb membrane or a composite of calcium phosphate cement composite with BMP promoted complete closure of critical-sized calvarial defects in New Zealand white rabbits with viable new %%%bone%%% at 12 weeks. The complete %%%bone%%% bridging observed with these composites suggests that they could be used to enhance the protection of intracranial contents following craniofacial surgical procedures.
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Record Date Completed: 20070108

2/7/12 (Item 12 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

17147072 PMID: 16858278
Mesenchymal stem cell sheets revitalize nonviable dense grafts: implications for repair of large-%%%bone%%% and tendon defects.
Ouyang Hong Wei; Cao Tong; Zou Xiao Hui; Heng Boon Chin; Wang Ling Ling; Song Xing Hui; Huang He Feng
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Transplantation (United States) Jul 27 2006, 82 (2) p170-4, ISSN 0041-1337--Print Journal Code: 0132144
Publishing Model:Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
BACKGROUND: Large musculoskeletal defects are commonly reconstructed with allogeneic grafts. As cryopreserved allogeneic grafts lack viable cells, this often results in poorer clinical outcome. Current technology can not incorporate large number of cells to the dense grafts. This study aimed to investigate the feasibility of fabricating sheets of mesenchymal stem cells (MSCs) to revitalize cryopreserved grafts. METHODS: Human MSCs were %%%isolated%%%, characterized, and cultured to form a cell sheet in the presence of ascorbic acid. Once a sheet of MSCs was obtained, it was assembled onto the %%%demineralized%%% %%%bone%%% grafts or frozen tendon grafts by a wrapping technique. Then the assembled structure was cultured for 3 weeks. The macro morphology, histology, and immunohistochemistry of the grafts were evaluated. RESULTS: It was found that MSCs were able to form coherent cellular sheets within 3 weeks. When assembled with %%%demineralized%%% %%%bone%%% matrix, MSC sheets were similar to in situ periosteum and were able to differentiate into the osteochondral lineage. When assembled with frozen tendon graft, MSCs sheets were well-incorporated within the tissue sheath (peritenon) around the tendon, and adopted the characteristic spindle-shaped morphology of tenocyte-like cells. CONCLUSIONS: The results therefore demonstrated that MSCs sheets are easily fabricated and can maintain their differentiation potential within particular scaffolds, which would suggest a novel and convenient strategy for revitalizing large tissue grafts to improve clinical outcome.
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Record Date Completed: 20060911

2/7/13 (Item 13 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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17118195 PMID: 16817587
The effects of %%%demineralized%%% %%%bone%%% matrix proteins and osteogenic protein-1 on %%%bone%%% cells %%%isolated%%% in culture.
Hardy Tabitha; Benghuzzi Ham; Russell George; Cameron Joseph; Tucci Michelle
Jackson State University, Jackson, MS 39216, USA.
Biomedical sciences instrumentation (United States) 2006, 42 p66-71,

ISSN 0067-8856--Print Journal Code: 0140524
Publishing Model: Print
Document type: Comparative Study; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE, Completed

With the growing number of %%%bone%%%-related traumas and the limitations of traditional %%%bone%%% repair, alternative methods of %%%bone%%% management must be investigated. %%%Demineralized%%% %%%bone%%% matrix protein (DBX) has been used to reconstruct %%%bone%%%. DBX, a type of %%%demineralized%%% %%%bone%%% matrix, is a combination of several different proteins including osteogenic protein-1 (OP-1). Osteogenic protein-1 or %%%Bone%%% Morphogenic Protein-7 (BMP-7) was the first BMP approved for clinical use in the United States. Previous studies have shown that proliferation of osteoblasts (%%%bone%%% forming cells) was stimulated by OP-1. However, the effects of DBM and OP-1 at the cellular level have not been clearly defined. MG-63 osteosarcoma cells were utilized as a model and subsequently plated onto 24 well tissue culture plates at a density of 1x 10(5) ml/well. Cells were exposed to different concentrations of DBX %%%demineralized%%% %%%bone%%% matrix and OP-1 for periods of 24, 48, and 72 hours and compared with untreated controls. After each incubation period, cell morphology, cell damage, cell number, and protein concentrations were determined. Results indicate a significant increase in cell number at 72 hours in cells treated with 30% (5.66 x 10(5)) and 100% (6.3 x 10(5)) DBX treated groups when compared with the control (1.4 x 10(5)). OP-1 results do not indicate a significant increase in cell number at the 24 and 48 hour treatment phases when compared with the control ($p > 0.05$), however, results do show a statistically significant difference (approximately twofold, $p < 0.05$) between the control cells (1.9 x 10(4)) and those cells treated with low (3.9 x 10(4)) and high (4.1 x 10(4)) concentrations of OP-1 at the 72 hour time phase. The increases in cell number indicate that both DBX and OP-1 are effective in stimulating cell growth. When comparing the results of the DBX treatments with those of the OP-1 treatments, the cells treated with DBX showed a more substantial increase in %%%bone%%% cell proliferation after treatment than those cells treated with OP-1. This does suggest that DBX provides the most effective treatment for %%%bone%%% cell proliferation. Closer evaluation of the morphology especially the changes occurring at the nuclear level need to be addressed in future studies.

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Record Date Completed: 20060727

2/7/14 (Item 14 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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16796821 PMID: 16708836
[The influence of mesenchymal stem cells on %%%bone%%% tissue regeneration upon implantation of %%%demineralized%%% %%%bone%%% matrix]
Krugliakov P V; Sokolova I B; Zin'kova N N; Vide S V; Cherednichenko N N ; Kisliakova T V; Polyntsev D G
Tsitologiia (Russia (Federation)) 2005, 47 (6) p466-77, ISSN 0041-3771--Print Journal Code: 0417363
Publishing Model: Print
Document type: English Abstract; Journal Article
Languages: RUSSIAN
Main Citation Owner: NLM
Record type: MEDLINE, Completed

Mesenchymal stem cells (MSC) are resident pluripotent cells of %%%bone%%% marrow stroma. MSC are able to differentiate into chondroblasts, adipocytes, neurons, glia, cardiomyocytes, or osteoblasts. The problem of MSC usage in cell therapy of %%%bone%%% defects is widely discussed at present. The experiments were carried out using rats of inbred line Wistar-Kyoto. MSC were %%%isolated%%% from %%%bone%%% marrow and cultivated in vitro. %%%Demineralized%%% %%%bone%%% matrices (DBM) were obtained from parietal bones of rats and hens. Part of DBM was loaded with MSC. %%%Bone%%% defects were made in cranium parietal regions. DBM with or without MSC or metal plates were transplanted in these regions. It was shown that the application of MSC increased angiogenesis and osteogenesis in the damaged %%%bone%%%. The implantation of rat's DBM with MSC led to the formation of a full value %%%bone%%%. MSC suppressed inflammation, when transplantation of hen's DBM was carried out. The application of MSC always improved %%%bone%%% tissue regeneration.

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Record Date Completed: 20060613

2/7/15 (Item 15 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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16461298 PMID: 15920736
Evaluation of polymer scaffolds to be used in a composite injectable system for intervertebral disc tissue engineering.
Brown R Quinn; Mount Andrew; Burg Karen J L
Department of Bioengineering, Clemson University, 501 Rhodes Engineering Research Center, Clemson, SC 29634, USA.
Journal of biomedical materials research. Part A (United States) Jul 1 2005, 74 (1) p92-9, ISSN 1549-3296--Print Journal Code: 101234237
Publishing Model: Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, Non-P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE, Completed

Adult porcine nucleus pulposus cells were seeded onto gelatin, %%%demineralized%%% %%%bone%%% matrix (DBM), and polylactide scaffolds and cultured in vitro. Cellular behavior in response to the scaffolds was analyzed using biochemical assays, histology, and real-time quantitative reverse transcriptase-polymerase chain reaction. Scanning electron microscopy showed pronounced differences in surface texture of the scaffolds. Nucleus pulposus cells attached and assumed an elongated fibroblast-like morphology on the gelatin and DBM scaffolds. The cells cultured on the gelatin and DBM were metabolically active and expressed types I and II collagen and aggrecan. Detached cellular aggregates with a rounded morphology were noted in the culture tubes containing the polylactide scaffolds. Both surface chemistry and texture likely had a role in causing differences in cellular behavior in response to scaffold material. Promising results were observed using the gelatin and %%%demineralized%%% %%%bone%%% scaffolds, but the behavior of cells cultured on these scaffolds will need to be characterized further. This initial research will be used to direct future work involved in developing this composite injectable tissue engineering system. (c) 2005 Wiley Periodicals, Inc.

Record Date Created: 20050629
Record Date Completed: 20050908

2/7/16 (Item 16 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

16287554 PMID: 15769306
Culture of osteoblasts on bio-derived bones.
Lan Xu; Yang Zhi-ming; Ge Bao-feng; Liu Xue-mei
Division of Stem Cell and Tissue Engineering, Key Laboratory of Biotherapy of Human Diseases of Ministry of Education, West China Hospital, Sichuan University, Chengdu 610041, China. lanxu2000@163.net
Zhonghua yixue zazhi = Zhonghua chuang shang za zhi / Chinese Medical Association (China) Apr 2005, 8 (2) p86-90, ISSN 1008-1275--Print Journal Code: 100886162
Publishing Model: Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE, Completed

OBJECTIVE: To study the effect of bio-derived bones, as substitutes of autogenous %%%bone%%% grafts and %%%demineralized%%% cadaver bones, on the attachment, spreading and proliferation of %%%isolated%%% osteoblasts.

METHODS: Osteoblasts were %%%isolated%%% from the calvaria of a fetal rabbit through sequential collagenase digestion. In the attachment study, the osteoblasts labeled with 3H-leucine were incubated with the bio-derived %%%bone%%% materials in sterile microcentrifugable tubes for 15, 90 and 180 minutes, and 24 hours, respectively. The attached cells were collected and the radioactivity was measured with liquid scintillation spectrometry. In the proliferation study, the osteoblasts were cultured with the bio-derived %%%bone%%% materials for 24 hours and 3H-thymidine was added during the last 2 hours of the incubation. The attached cells were collected and the radioactivity was measured with liquid scintillation spectrometry. Osteoblasts were seeded on the %%%bone%%% graft materials for 60 or 120 minutes, 24 or 48 hours, and 3 or 7 days, then the co-culture was processed for scanning electron microscopy to observe the interaction of osteoblasts and the bio-derived %%%bone%%% materials. RESULTS: Osteoblasts attached to the bio-derived %%%bone%%% materials in a time-dependent manner. There were significantly (P<0.05) more attached cells after 180 minutes than after 15 and 90 minutes of incubations (P<0.05). Osteoblasts were proliferated in a large amount on the surface and in the materials. Osteoblasts seeded onto 100 mg bio-derived bones resulted in significantly (P<0.05) more measurable proliferation than those seeded onto 10 mg bones. Osteoblasts appeared round as they attached to the materials, then flattened and spread over with time passing. CONCLUSIONS: Bio-derived bones can provide a good environment for the attachment and proliferation of osteoblasts.
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Record Date Completed: 20050705

2/7/17 (Item 17 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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16260642 PMID: 15735897
Extractable %%%bone%%% morphogenetic protein and correlation with induced new %%%bone%%% formation in an in vivo assay in the athymic mouse model.
Honsawek Sittisak; Powers Ralph M; Wolfinbarger Lloyd
LifeNet, 5809 Ward Court, Virginia Beach, VA 23455, USA.
Cell and tissue banking (Netherlands) 2005, 6 (1) p13-23, ISSN 1389-9333--Print Journal Code: 100965121
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
A correlation between extractable %%%bone%%% morphogenetic proteins (BMPs) in %%%demineralized%%% %%%bone%%% matrix (DBM) and osteoinduction has been suggested. Extractable BMP-4 and osteoinductivity of DBM from 40 donors were assessed using enzyme-linked immunosorbent assay (ELISA) and in vivo athymic mouse assay, respectively. Extractable BMP-4 level averaged 3.7 0.21 ng/g of DBM and correlated with osteoinductivity of the DBM in an in vivo assessment of induced newbone formation.
Record Date Created: 20050228
Record Date Completed: 20050728

2/7/18 (Item 18 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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16186043 PMID: 15607890
BMP binding peptide: a BMP-2 enhancing factor deduced from the sequence of native bovine %%%bone%%% morphogenetic protein/non-collagenous protein.
Behnam Keyvan; Phillips Martin L; Silva Jose Denison Prado; Brochmann Elisa J; Duarte Maria Eugenia Leite; Murray Samuel S
Department of Physiological Science, University of California, Los Angeles, CA 90024, USA.
Journal of orthopaedic research : official publication of the Orthopaedic Research Society (United States) Jan 2005, 23 (1) p175-80, ISSN 0736-0266--Print Journal Code: 8404726
Publishing Model Print; Comment in J Orthop Res. 2006 Jul;24(7) 1571-2; author reply 1572-4, Comment in PMID 16779817
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, Non-P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Forty years ago, Marshall Urist described a partially %%%purified%%% extract of %%%demineralized%%% %%%bone%%% matrix which induced the formation of ectopic %%%bone%%%. This substance, %%%bone%%% morphogenetic protein/non-collagenous protein (BMP/NCP), was never %%%purified%%% to homogeneity but other investigators used similar starting materials to clone a number of recombinant BMPs. Urist recognized that his material probably contained the BMPs which had been cloned by others but always contended that it contained another, more potent, %%%bone%%% inducing material which differed significantly in its physical and chemical properties from the known BMPs. We have used Urist's protocol to %%%isolate%%% a protein that has the chemical and physical properties of Urist's "BMP". It is an 18.5 kD fragment of the %%%bone%%% matrix protein, SPP-24. This fragment contains the cystatin-like domain of SPP-24. We have located a 19 amino acid region which is similar to the TGF-beta/BMP-binding region of fetuin, a member of the cystatin family of protease inhibitors. A cyclic peptide, which we call BMP binding peptide (BBP) was generated using this sequence. The peptide avidly bound rhBMP-2 with a KD of 3 x 10(-5) M. When implanted alone in mouse muscle, the peptide frequently induced dystrophic calcification. When implanted with rhBMP-2, the peptide enhanced the osteogenic activity of the recombinant molecule. We hypothesize that Urist's "BMP" was a fragment of SPP-24 which influenced %%%bone%%% induction by binding to %%%bone%%% morphogenetic proteins. BBP may be clinically useful because of its effects on other %%%bone%%%-inducing substances.
Record Date Created: 20041220
Record Date Completed: 20050210

2/7/19 (Item 19 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

15953522 PMID: 15355569
Comparison of TGF-beta/BMP pathways signaled by %%%demineralized%%% %%%bone%%% powder and BMP-2 in human dermal fibroblasts.
Zhou Shuanhu; Glowacki Julie; Yates Karen E
Department of Orthopedic Surgery, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts, USA.
Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research (United States) Oct 2004, 19 (10) p1732-41, ISSN 0884-0431--Print Journal Code: 8610640
Contract/Grant No.: AR044873; AR; United States NIAMS
Publishing Model Print-Electronic
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
%%%Demineralized%%% %%%bone%%% induces chondrogenic differentiation of human dermal fibroblasts in vitro. Analyses of signaling gene expression showed that DBP and BMP-2 regulate common and distinct pathways. Although BMP-2 was originally %%%isolated%%% as a putative active factor in DBP, rhBMP-2 and DBP do not affect all the same genes or in the same ways. INTRODUCTION: %%%Demineralized%%% %%%bone%%% powder (DBP) induces chondrogenic differentiation of human dermal fibroblasts (hDFs) in 3D culture, but the initiating mechanisms have not been identified. We tested the hypotheses that DBP would affect expression of signaling genes and that DBP's effects would differ from the effects of %%%bone%%% morphogenetic proteins (BMPs). MATERIALS AND METHODS: A chondroinduction model was used in which hDFs were cultured with and without DBP in a porous collagen sponge. BMP-2 was delivered in a square of absorbable collagen felt inserted into a collagen sponge. Total RNA was %%%isolated%%% after 3 days of culture, a time that precedes expression of the chondrocyte phenotype. Gene expression was evaluated with two targeted macroarray screens. Effects of DBP and rhBMP-2 were compared by macroarray, RT-PCR, and Northern

hybridization analysis of selected genes in the transforming growth factor (TGF)-beta/BMP signaling pathways. RESULTS: By macroarray analysis of 16 signal transduction pathways, the following pathways were modulated in hDPs by DBP: TGF-beta, insulin/LDL, hedgehog, PI3 kinase/AKT, NF-kappaB, androgen, retinoic acid, and NFAT. There was convergence and divergence in DBP and rhBMP-2 regulation of genes in the TGF-beta/BMP signaling pathway. Smad target genes were the predominant group of DBP- or rhBMP-2-regulated genes. Several genes (IGF-BP3, ID2, and ID3) showed similar responses (increased expression) to DBP and rhBMP-2. In contrast, many of the genes that were greatly upregulated by DBP (TGFBI/betaig-h3, Col3A1, TIMP1, p21/Waf1/Cip1) were barely affected by rhBMP-2. CONCLUSION: These findings indicate that multiple signaling pathways are regulated in fibroblasts by DBP, that one of the major pathways involves Smad target genes, and that DBP and rhBMP-2 elicit different gene expression responses in hDFs. Although BMP-2 was originally %%%isolated%%% as a putative inductive factor in DBP, rhBMP-2 and DBP do not affect all the same genes or in the same ways.

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Date of Electronic Publication: 20040707

2/7/20 (Item 20 from file: 155)
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15849827 PMID: 15231021

In vitro differentiation of CD14 cells from osteopetrotic subjects: contrasting phenotypes with TCIRG1, CLCN7, and attachment defects.

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Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research (United States) Aug 2004, 19 (8) p1329-38, ISSN 0884-0431--Print Journal Code: 8610640

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Document type: Comparative Study; Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, Non-P.H.S.; Research Support, U.S. Gov't, P.H.S.

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

We studied osteoclastic differentiation from normal and osteopetrotic human CD14 cells in vitro. Defects in acid transport, organic matrix removal, and cell fusion with deficient attachment were found. Analysis of genotypes showed that TCIRG1 anomalies correlated with acid transport defects, but surprisingly, organic matrix removal failure correlated with CLCN7 defects; an attachment defect had normal TCIRG1 and CLCN7. INTRODUCTION: Osteopetrotic subjects usually have normal macrophage activity, and despite identification of genetic defects associated with osteopetrosis, the specific developmental and biochemical defects in most cases are unclear. Indeed, patients with identical genotypes often have different clinical courses. We classified defects in osteoclast differentiation in vitro using four osteopetrotic subjects without immune or platelet defects, three of them severe infantile cases, compared with normals. MATERIALS AND METHODS: Osteoclast differentiation used %%%isolated%%% CD14 cells; results were correlated with independent analysis of two key genes, CLCN7 and TCIRG1. CD14 cell attachment and cell surface markers and extent of differentiation in RANKL and colony-stimulating factor (CSF)-1 were studied using acid secretion, %%%bone%%% pitting, enzyme, and attachment proteins assays. RESULTS AND CONCLUSIONS: CD14 cells from all subjects had similar lysosomal and nonspecific esterase activity. With the exception of cells from one osteopetrotic subject, CD14 cells from osteopetrotic and control monocytes attached similarly to %%%bone%%% or tissue culture substrate. Cells from one osteopetrotic subject, with normal CLCN7 and TCIRG1, did not attach to %%%bone%%% , did not multinucleate, and formed no podosomes or actin rings in RANKL and CSF-1. Attachment defects are described in osteopetrosis, most commonly mild osteopetrosis with Glanzmann's thrombasthenia. However, this case, with abnormal integrin alphavbeta3 aggregates and no osteoclasts, seems to be unique. Two subjects were compound heterozygotes for TCIRG1 defects; both had CD14 cells that attached to %%%bone%%% but did not acidify attachments; cell fusion and attachment occurred, however, in RANKL and CSF-1. This is consistent with TCIRG1, essential for H+ATPase assembly at the ruffled border. A compound heterozygote for CLCN7 defects had CD14 cells that fused in vitro, attached to %%%bone%%%, and secreted acid, TRACP, and cathepsin K. However, lacunae were shallow and retained %%%demineralized%%% matrix. This suggests that CLCN7 may not limit H+ATPase activity as hypothesized, but may be involved in control of organic matrix degradation or removal.

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Record Date Completed: 20050316
Date of Electronic Publication: 20040405

2/7/21 (Item 21 from file: 155)
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15815085 PMID: 15191589

Histologic evaluation of %%%demineralized%%% freeze-dried %%%bone%%% allografts in barrier membrane covered periodontal fenestration wounds and ectopic sites in dogs.

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Journal of clinical periodontology (Denmark) Jul 2004, 31 (7) p534-44, ISSN 0303-6979--Print Journal Code: 0425123

Publishing Model Print

Document type: Comparative Study; Journal Article; Research Support, Non-U.S. Gov't

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

BACKGROUND/AIM: The aim of this study was to investigate healing responses to %%%demineralized%%% freeze-dried %%%bone%%% powder allografts in standardized periodontal fenestration defects, compared with subcutaneous wounds in a dog model. METHODS: Circular periodontal fenestration defects were created bucally at all four canines in 14 mongrel dogs. Each site received one of the following underneath a barrier membrane. (a) ethylene oxide (EO)-sterilized %%%demineralized%%% freeze-dried %%%bone%%% allografts (DFDBA), (b) heat-treated DFDBA, (c) non-sterilized DFDBA and (d) ungrafted control. Twelve of the 14 dogs had three subcutaneous chest wall pouches created and one of the three DFDBA materials placed in each. The animals were necropsied at 4 weeks. Histologic sections were prepared through the center of the fenestration sites in an apico-coronal direction. Quantitative analysis using computer-assisted imaging technique was performed. Subcutaneous implants were evaluated histologically and quantified for associated inflammatory cell infiltrate. RESULTS: Fenestration defects healed by partial osseous fill and cementum regeneration with formation of a periodontal ligament. The graft particles generally appeared %%%isolated%%% from the site of osteogenesis and covered by cementum-like substance. Graft particles incorporated into newly formed %%%bone%%% at a distance from the root surface was the exception. No statistically significant differences in new %%%bone%%% formation were observed between treatment groups within animals, but significant inter-animal variation was found (p<0.01). Quantities of retained graft particles were limited, and without cellular resorption. A %%%bone%%% augmentation effect was associated with the barrier in the majority of sites. No %%%bone%%% formation was evident at the subcutaneous sites where graft particles displayed distinctly modified surface zones and multinucleated giant cell resorption. Significantly more inflammatory infiltrate was associated with EO-sterilized grafts compared with heat-treated grafts (p<0.05). CONCLUSION: Implantation of DFDBA neither enhanced osseous healing in periodontal fenestration defects, nor resulted in ectopic %%%bone%%% induction. DFDBA particles implanted in either periodontal fenestration or subcutaneous wounds evoked distinctly different

healing responses.
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Record Date Completed: 20040726

2/7/22 (Item 22 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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15801103 PMID: 15176456
The osteoinductive activity of %%%bone%%% morphogenetic protein (BMP) %%%purified%%% by repeated extracts of bovine %%%bone%%%.
Hu Zhen Ming; Peel Sean A F; Sandor George K B; Clokie Cameron M L
Faculty of Dentistry, Orthobiologics Laboratory, Department of Oral and Maxillofacial Surgery, University of Toronto, Toronto, Canada. zminghu@hotmail.com
Growth factors (Chur, Switzerland) (England) Mar 2004, 22 (1) p29-33
, ISSN 0897-7194--Print Journal Code: 9000468
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Native %%%bone%%% morphogenetic proteins (BMPs) extracted from %%%bone%%% have been used clinically to stimulate %%%bone%%% regeneration and repair. However, preparation of %%%purified%%% BMP is a laborious process. This study investigated the yield, activity and cost effectiveness of repeatedly extracting the same %%%bone%%% matrix to produce %%%purified%%% BMP. While repeated extraction was able to increase the yield 62% the activity of the partially %%%purified%%% BMP in later extracts decreased both in vitro and in vivo. This decline in activity appears to be due to an increase in non-BMP contaminants, such as collagen, in the extracts. When the first three extracts were combined and processed together activity was equivalent to that of the first extract. A simple analysis based on the cost of reagents used and the time required for %%%purification%%% indicates that repeated processing of the extracts is inefficient while combining the first and second extracts and processing them together would result in a small cost saving. Based on this study we would recommend that the %%%demineralized%%% %%%bone%%% matrix be extracted no more than twice and that the extracts be combined for further processing.
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2/7/23 (Item 23 from file: 155)
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15793393 PMID: 15165454
Human adipose-derived adult stem cells produce osteoid in vivo.
Hicok Kevin C; Du Laney Tracey V; Zhou Yang Sheng; Halvorsen Yuan-Di C; Hitt Daron C; Cooper Lyndon F; Gimble Jeffrey M
Artecel Sciences, Durham, North Carolina, USA.
Tissue engineering (United States) Mar-Apr 2004, 10 (3-4) p371-80, ISSN 1076-3279--Print Journal Code: 9505538
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Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Adult subcutaneous fat tissue is an abundant source of multipotent cells. Previous studies from our laboratory have shown that, in vitro, adipose-derived adult stem (ADAS) cells express %%%bone%%% marker proteins including alkaline phosphatase, type I collagen, osteopontin, and osteocalcin and produce a mineralized matrix as shown by alizarin red staining. In the current study, the ADAS cell ability to form osteoid in vivo was determined. ADAS cells were %%%isolated%%% from liposuction waste of three individual donors and expanded in vitro before implantation. Equal numbers of cells (3 x 10(6)) were loaded onto either hydroxyapatite/tricalcium phosphate (HA-TCP) cubes or the collagen/HA-TCP composite matrix, Collagraft, and then implanted subcutaneously into SCID mice. After 6 weeks, implants were removed, fixed, and %%%demineralized%%% and sectioned for hematoxylin and eosin staining. Osteoid formation was observed in 80% of HA-TCP implants loaded with ADAS cells. Only 20% of Collagraft implants were positive for the presence of osteoid matrix. Whereas 100% of HA-TCP implants loaded with hFOB 1.19 cells formed osteoid, Collagraft loaded with hFOB 1.19 cells displayed a high degree of adipose tissue within the matrix. Immunostaining of serial sections for human nuclear antigen demonstrated that the osteoid contained human cells. Osteoid formation was not observed in control HA-TCP or Collagraft matrices implanted without cells. In summary, the data demonstrate the ability of ADAS cells to form osteoid matrix in vivo. Because of their abundance and accessibility, ADAS cells may prove to be a novel cell therapeutic for %%%bone%%% repair and regeneration
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Record Date Completed: 20050113

2/7/24 (Item 24 from file: 155)
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15609260 PMID: 14745234
New chondrocyte genes discovered by representational difference analysis of chondroinduced human fibroblasts.
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Cells, tissues, organs (Switzerland) 2004, 176 (1-3) p41-53, ISSN 1422-6405--Print Journal Code: 100883360
Contract/Grant No.: AR44873; AR; United States NIAMS
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
This report includes a review of the potential for gene expression analyses to provide new information for solving problems in skeletal repair and regeneration. It focuses on two approaches: high-throughput gene array methods and representational difference analysis (RDA). The principles underlying these methods are presented with experimental tutorials and some applications. Second, this report includes a review of results from applying both approaches to an in vitro model of postnatal chondroinduction by %%%demineralized%%% %%%bone%%% powder (DBP). Human dermal fibroblasts (hDFs) cultured with DBP acquire a chondroblast phenotype and express cartilage-specific matrix proteins after 7 days. We used cDNA macroarrays and RDA to identify the genes that were altered prior to expression of the chondroblast phenotype, i.e., after only 3 days' culture with DBP. Using a strategy of data management and reduction based upon biological functions, we reported several functional families of genes (cytoskeletal elements, protein synthesis/trafficking, and matrix molecules and their modifiers) that are upregulated during chondroinduction of hDFs. Together with histological and biochemical evidence of the chondroblast phenotype, the gene expression patterns indicate that there are specific stages of induced chondrocyte differentiation in this experimental system. Third, this report includes a new study, in which DBP-regulated genes were used as a data base to derive new information on the cell biology of chondrocytes. The objective was to determine whether a set of genes expressed during induction of chondrocyte differentiation is also expressed by mature articular chondrocytes. Our search of the literature for 59 of the DBP-regulated genes disclosed that expression of 20 of them (33%) had been documented in mature cartilage or chondrocytes. Of the 39 genes not previously documented in cartilage, 11 were tested by RT-PCR and all were found to be expressed in freshly %%%isolated%%% adult human chondrocytes. This review and these new data show how the strategy of high-throughput methods and functional data reduction can expand our knowledge of chondrocyte cell biology. Copyright 2004 S. Karger AG, Basel
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2/7/25 (Item 25 from file: 155)
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15492295 PMID: 14642102
[Clinical application of tissue engineered %%%bone%%% repair of human craniomaxillofacial %%%bone%%% defects]
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Department of Plastic and Reconstructive Surgery, Ninth People's Hospital, Shanghai Second Medical University, Shanghai Tissue Engineering Center, Shanghai 200011, China.
Zhonghua yi xue za zhi (China) Oct 10 2003, 83 (19) p1676-81, ISSN 0376-2491--Print Journal Code: 7511141
Publishing Model Print
Document type: English Abstract; Journal Article, Research Support, Non-U.S. Gov't
Languages: CHINESE
Main Citation Owner: NLM
Record type: MEDLINE; Completed
OBJECTIVE: To explore the feasibility of tissue engineered %%%bone%%% formation in human being using human %%%bone%%% marrow stromal cells (hBMSCs) and the possibility of clinical repair of craniomaxillofacial %%%bone%%% defects with tissue engineered %%%bone%%%. METHODS: Total 11 patients of cranial defects and aperture piriformis %%%bone%%% depression were included in this study. The hBMSCs were %%%isolated%%% by Percoll gradient centrifugation from patient's %%%bone%%% marrow aspirated from iliac crest. The hBMSCs were cultured in vitro and induced to become osteogenic cells in the DMEM medium containing 10% self-serum, beta-glycerophosphate (10 nmol/L) dexamethasone (10(-8) mol/L), L-2-ascorbic acid (50 micro mol/L), and 1, 25 (OH)(2)VD(3)(10 nmol/L). Induced hBMSCs of passage 3 were harvested and seeded onto partly %%%demineralized%%% allogenic %%%bone%%% matrix (pDBM) to form a cell-scaffold construct and in vitro co-culture for 1 week. The defects were repaired with the cell-scaffold construct. In 3 cases of aperture piriformis %%%bone%%% depression, one side was repaired with hBMSC/pDBM, while the other side was repaired by pDBM alone. All cases were followed up for 1, 3, 6 months post-operation as short-term evaluation and 1 to 2.5 years post-operation as long-term evaluation by three-dimensional computerized tomography (3D-CT) and clinical examination. In 2 cases who received secondary surgery, extra engineered %%%bone%%% tissue and control pDBM were harvested at the implantation sites for histological examination and immunohistochemistry. RESULTS: 3D-CT demonstrated that engineered %%%bone%%% was formed in 3 to 6 months post-operation. Additionally, formed %%%bone%%% maintained stable up to 1 - 2 years without absorption. Histologically, engineered bones revealed their structures similar to that of normal %%%bone%%% in HE staining. Interestingly, endochondral ossification was also observed in engineered %%%bone%%%. Immunohistochemistry shows positive staining of osteonectin and osteocalcin in engineered and normal bones. In contrast, implanted pDBM was completely degraded in 3 - 6 months as revealed by 3D-CT. Histologically, degraded pDBM and fibrous tissue were observed in the sites where pDBM alone was implanted. CONCLUSIONS: Tissue engineered %%%bone%%% can be formed in human being. Engineered %%%bone%%% can be used to repair clinical %%%bone%%% defect with satisfactory result. Furthermore, the result of this study proves that tissue engineered %%%bone%%% is possible for clinical application.
Record Date Created: 20031203
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2/7/26 (Item 26 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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15436910 PMID: 14584860
Periodontal regeneration in humans using recombinant human platelet-derived growth factor-BB (rhPDGF-BB) and allogenic %%%bone%%%.
Nevins Myron; Camelo Marcelo; Nevins Marc L; Schenk Robert K; Lynch Samuel E
Institute for Advanced Dental Studies, Swampscott, MA, USA. office@pericopc.com
Journal of periodontology (United States) Sep 2003, 74 (9) p1282-92, ISSN 0022-3492--Print Journal Code: 8000345
Publishing Model Print
Document type: Clinical Trial; Journal Article; Randomized Controlled Trial; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
BACKGROUND: %%%Purified%%% recombinant human platelet-derived growth factor BB (rhPDGF-BB) is a potent wound healing growth factor and stimulator of the proliferation and recruitment of both periodontal ligament (PDL) and %%%bone%%% cells. The hypothesis tested in this study was that application of rhPDGF-BB incorporated in %%%bone%%% allograft would induce regeneration of a complete new attachment apparatus, including %%%bone%%%, periodontal ligament, and cementum in human interproximal intrabony defects and molar Class II furcation lesions. METHODS: Nine adult patients (15 sites) with advanced periodontitis exhibiting at least one tooth requiring extraction due to an extensive interproximal intrabony and/or molar Class II furcation defect were entered into the study. Eleven defects were randomly selected to receive rhPDGF-BB. Following full-thickness flap reflection and initial debridement, the tooth roots were notched at the apical extent of the calculus, the osseous defects were thoroughly debrided, and the tooth root(s) were planed/prepared. The osseous defects were then filled with %%%demineralized%%% freeze-dried %%%bone%%% allograft (DFDBA) saturated with one of three concentrations of rhPDGF-BB (0.5 mg/ml, 1.0 mg/ml, or 5.0 mg/ml). Concurrently, four interproximal defects were treated with a well accepted commercially available graft (anorganic bovine %%%bone%%% in collagen, ABB-C) and a bilayer collagen membrane. Radiographs, clinical probing depths, and attachment levels were obtained preoperatively (at baseline) and 9 months later. At 9 months postoperatively, the study tooth and surrounding tissues were removed en bloc. Clinical and radiographic data were analyzed for change from baseline by defect type and PDGF concentration. The histologic specimens were analyzed for the presence of regeneration of a complete new attachment apparatus: coronal to the reference notch. RESULTS: The post-surgical wound rapidly healed and was characterized by firm, pink gingivae within 7 to 10 days of surgery. There were no unfavorable tissue reactions or other safety concerns associated with the treatments throughout the course of the study. In rhPDGF/allograft sites, the vertical probing depth (VPD) reduction for interproximal defects was 6.42 1.69 mm (mean SD) and clinical attachment level (CAL) gain was 6.17 1.84 mm (both P < 0.01). Radiographic fill was 2.14 0.85 mm. Sites filled with ABB-C had a PD reduction and CAL gain of 5.75 0.5 and 5.25 1.71, respectively. Furcation defects treated with rhPDGF/allograft exhibited a mean horizontal and vertical PD reduction of 3.40 0.55 mm (P < 0.001) and 4.00 1.58 mm (P < 0.005), respectively. The CAL gain for furcation defects was 3.2 2.17 mm (P < 0.030). Histologic evaluation revealed regeneration of a complete periodontal attachment apparatus, including new cementum, PDL, and %%%bone%%% coronal to the root notch in four of the six interproximal defects and all evaluable (four of four) furcation defects treated with PDGF. Two of the four interproximal intrabony defects treated with ABB-C and membrane exhibited regeneration. CONCLUSIONS: Use of %%%purified%%% rhPDGF-BB mixed with %%%bone%%% allograft results in robust periodontal regeneration in both Class II furcations and interproximal intrabony defects. This is the first report of periodontal regeneration demonstrated histologically in human Class II furcation defects.
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Record Date Completed: 20031216

2/7/27 (Item 27 from file: 155)
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15248267 PMID: 12826798
In search of the ideal %%%bone%%% morphogenetic protein delivery system.

in vitro studies on %%%demineralized%%% %%%bone%%% matrix, %%%purified%%%, and recombinant %%%bone%%% morphogenetic protein.

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Journal of craniofacial surgery (United States) May 2003, 14 (3) p284-91, ISSN 1049-2275--Print Journal Code: 9010410

Publishing Model Print

Document type: Comparative Study; Journal Article; Research Support, Non-U.S. Gov't

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

The clinical use of recombinant %%%bone%%% morphogenetic protein (rBMP) is limited by the lack of a suitable delivery system. The %%%bone%%% morphogenetic protein (BMP) delivery system provided by nature is highly effective, and by studying %%%purified%%% BMP (BMP/NCP) and %%%demineralized%%% %%%bone%%% matrix (DBM), it may be possible to learn how to emulate nature's success. The current study used an in vitro muscle cell model to study the activity of BMP/NCP and DBM and the effects of extracellular matrix on BMP activity. C2C12 cells transiently exposed to recombinant human BMP-4 (rhBMP-4) rapidly increased their alkaline phosphatase (AP) activity to day 5, after which it steadily declined. Cells exposed to BMP/NCP or DBM continued to increase their AP activity over the 14-day culture. If BMP/NCP was treated to remove a 22-kd protein, it became water-soluble and exhibited a similar activity pattern to rhBMP-4. Cells cultured on collagen type I, fibronectin, and hyaluronic-coated surfaces demonstrated increased AP activity when exposed to rhBMP-4 or BMP/NCP compared with cells cultured on bovine serum albumin or poly-l-lysine. These results suggest that the natural BMP delivery system operates both by binding to the BMP molecule and slowly releasing it into the extracellular milieu and by interacting with the responding cells through cell-matrix receptors to enhance the cellular response to BMP.

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2/7/28 (Item 28 from file: 155)
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14816059 PMID: 12350083

The effect of swimming on cartilage formation.

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Department of Food and Nutrition, Japan Women's University, Tokyo.

Journal of nutritional science and vitaminology (Japan) Jun 2002, 48 (3) p238-41, ISSN 0301-4800--Print Journal Code: 0402640

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Document type: Journal Article; Research Support, Non-U.S. Gov't

Languages: ENGLISH

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Record type: MEDLINE; Completed

Swimming is a non-weight-bearing exercise. Therefore it has the advantage of maintaining skeletal integrity in aged persons with weakened skeletal structures. Unlike other weight-bearing aerobic exercises, however, it does not appear to exert sufficient stimulus on %%%bone%%% remodeling activities because the local load-bearing on %%%bone%%% tissues is mild. The purpose of this study was to investigate the effect of swimming on %%%bone%%% remodeling, especially with the use of implanted pellets containing %%%bone%%% morphogenetic protein (BMP) and %%%demineralized%%% %%%bone%%% matrix during the initial stages of the differentiation of mesenchymal cells to cartilage cells. Six-week-old female rats were divided into the swimming group and a control, nonswimming group. Test animals were forced to swim in a water bath for 30 min daily for 2 wk. After the swimming protocol, pellets were implanted and harvested. Messenger RNA %%%isolated%%% from pellets was quantified by means of a reverse transcription-polymerase chain reaction. The expression of RNAs for %%%bone%%% sialoprotein and BMP-6 in pellets from the swimming group was apparently enhanced at 7 d after implantation. These results suggested that systemic hormonal and/or metabolic changes that promote cartilage formation might have occurred after swimming because the effect was observed after the swimming protocol had ended and the pellets were implanted at a non-weight-bearing site.

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2/7/29 (Item 29 from file: 155)
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14779180 PMID: 12205421

%%%Purified%%% bovine BMP extract and collagen for spine arthrodesis: preclinical safety and efficacy.

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Sulzer Biologics, Wheat Ridge, Colorado, USA.

Spine (United States) Aug 15 2002, 27 (16 Suppl 1) pS50-8, ISSN 1528-1159--Electronic Journal Code: 7610646

Publishing Model Print

Document type: Comparative Study; Journal Article; Research Support, Non-U.S. Gov't

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

STUDY DESIGN. Rabbit and nonhuman primate posterolateral intertransverse process spinal fusions were performed. OBJECTIVES. To determine the preclinical safety and efficacy of bBMPx product (a composite of collagen and bovine %%%bone%%% morphogenetic protein extract) mixed with %%%demineralized%%% %%%bone%%% matrix for posterolateral intertransverse process spinal fusions. SUMMARY OF BACKGROUND DATA. A dose response of bovine BMP extract with collagen in %%%demineralized%%% %%%bone%%% matrix has demonstrated spinal fusion to a rate of 100% in a rabbit spinal fusion model. This study furthers the research to demonstrate safety in the rabbit and efficacy of bovine BMP extract for spinal fusion applications in nonhuman primates. Additionally, preliminary human clinical data are presented. METHODS. For the safety portion of the study, 45 New Zealand white rabbits underwent posterolateral intertransverse process spinal fusion after laminectomy. Nine additional rabbits served as nontreated control subjects. Graft material (autograft or bBMPx product) was placed in the gutters in 30 animals, and no material was used in 15 animals. The animals were observed for abnormal physical activity, then killed at 8, 29, or 57 days. Histologic evaluation was performed on explanted spines. In the nonhuman primate efficacy studies, 54 rhesus macaques also underwent bilateral posterolateral intertransverse process fusion. bBMPx product with varying bovine BMP extract doses was implanted bilaterally. The animals were killed at 4, 8, 12, 18, or 24 weeks. Plain radiograph, computed tomography scanning, and histology were performed. RESULTS. The rabbit safety study demonstrated that any spinal cord compression or degeneration was caused by the inflammatory response after surgery and was equivalent in all groups. These issues resolved over time. Efficacy data demonstrated an autograft fusion rate of only 21% in the rhesus macaques. The bovine BMP extract demonstrated a dose response in which 3 mg per side gave twice the fusion rate as autograft. CONCLUSIONS: bBMPx product is safe and effective as an autograft substitute for posterolateral intertransverse process spinal fusion. Clinical studies are underway.

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Record Date Completed: 20021121

2/7/30 (Item 30 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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14693119 PMID: 12097834

Effect of porcine fetal enamel matrix derivative on chondrocyte proliferation, differentiation, and local factor production is dependent on cell maturation state.

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Schwartz Z
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Cells, tissues, organs (Switzerland) 2002, 171 (2-3) p117-27, ISSN 1422-6405--Print Journal Code: 100883360
Contract/Grant No.: DE-08603; DE; United States NIDCR
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Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Recent studies have shown that porcine fetal enamel matrix derivative (EMD) can enhance the osteoinductive ability of %%%demineralized%%% freeze-dried %%%bone%%% allograft (DFDBA) in a nude mouse muscle implantation model. This suggests that one or more components of EMD can regulate the process of endochondral ossification initiated by DFDBA. To substantiate this hypothesis, in the current study, chondrocytes in the endochondral pathway at two stages of maturation were tested for their response to EMD. Chondrocytes were %%%isolated%%% from the resting zone and growth zone (prehypertrophic and upper hypertrophic cell zones) of the costochondral growth plate cartilage of adolescent rats. The results showed that the relatively immature resting zone cells responded to EMD with an increase in proliferation and a decrease in differentiation as measured by alkaline-phosphatase-specific activity. In addition, EMD stimulated a fivefold increase in PGE(2) production, but was without effect on collagen synthesis, proteoglycan sulfation, and TGF-beta(1) production. The more mature growth zone cells also responded to EMD with increased proliferation, but alkaline-phosphatase-specific activity was unchanged, and there was only a modest increase in PGE(2) production. In contrast to resting zone cells, growth zone cells exhibited a decrease in collagen synthesis, proteoglycan sulfation, and TGF-beta(1) production. These observations indicate that EMD has prominent effects on cells in the endochondral pathway, in particular, EMD stimulates the production of more cells, but inhibits their maturation. This would increase the pool of cells available for subsequent differentiation in response to other factors.
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14644064 PMID: 12040215
Human segmental mandibular defects treated with naturally derived %%%bone%%% morphogenetic proteins.
Ferretti Carlo; Ripamonti Ugo
Division of Maxillofacial and Oral Surgery, Baragwanath Hospital and University of the Witwatersrand, Johannesburg, South Africa.
Journal of craniofacial surgery (United States) May 2002, 13 (3) p434-44, ISSN 1049-2275--Print Journal Code: 9010410
Publishing Model Print
Document type: Clinical Trial, Comparative Study; Controlled Clinical Trial; Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
%%%Bone%%% induction with extracted and partially %%%purified%%%, naturally derived %%%bone%%% morphogenetic proteins (BMPs) has been demonstrated repeatedly in heterotopic and orthotopic sites of non-human primates. This spawned the investigation of %%%bone%%% regeneration in mandibular defects of human patients with naturally derived BMPs and was compared with osteogenesis in patients treated with autologous %%%bone%%% grafts (ABGs). The osteogenic device (OD) was formulated as a combination of human %%%demineralized%%% %%%bone%%% matrix as delivery system reconstituted with naturally derived BMPs. BMPs were extracted from bovine %%%bone%%% with chaotropic agents and %%%purified%%% by sequential chromatography. Thirteen patients with segmental mandibular defects were enrolled in the trial, 6 of whom received the OD and 7 the ABGs. Defects were reconstructed with a preformed titanium mesh. The OD was combined with sterile saline and applied to the defects as a paste. Autologous %%%bone%%% from the iliac crest was prepared as a cortico-cancellous %%%bone%%% graft and loaded into the titanium mesh. Patients were followed-up clinically and radiographically at 1 and 6 weeks, 3, 6, and 12-month post-implantation. A trephine biopsy of the implants was performed at 3 months post-implantation and the specimens examined on serial undecalcified sections. Histological examination showed that the OD induced %%%bone%%% in 2 of 6 patients treated. Histological examination of successful implanted OD exhibited mineralized %%%bone%%% trabeculae with copious osteoid seams lined by contiguous osteoblasts. %%%Bone%%% deposition directly onto non-vital matrix provided unequivocal evidence of osteoinduction. Of the 7 patients grafted with ABGs, 5 had histological evidence of osteogenesis. Morphometric analysis of the histological sections showed that, when successful, OD-treated defects had highly active osteogenesis compared with ABGs. Whilst this trial provides valuable insights for the use of BMPs in mandibular reconstruction further work is required to produce an OD that will perform reliably in clinical contexts.
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Record Date Completed: 20021002

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DIALOG(R)File 155:MEDLINE(R)
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14631896 PMID: 12023890
Natural variation in the extent of phosphorylation of %%%bone%%% phosphoproteins as a function of in vivo new %%%bone%%% formation induced by %%%demineralized%%% %%%bone%%% matrix in soft tissue and bony environments.
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Biochemical journal (England) Jun 1 2002, 364 (Pt 2) p465-74, ISSN 0264-6021--Print Journal Code: 2984726R
Contract/Grant No.: R01 AG17969; AG; United States NIA
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
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Implants of allogenic %%%demineralized%%% %%%bone%%% matrix were placed in distinct in vivo environments, i.e. calvarial (bony) and subcutaneous (soft tissue) sites. Detailed analyses of the biochemical components were performed. Quantitative levels of osteopontin (OPN), %%%bone%%% sialoprotein (BSP) and calcium phosphate (Ca-P) deposition within each implant environment varied as a function of new %%%bone%%% formation, and were substantially different in samples from calvarial and subcutaneous sites. Quantification of the extent of phosphorylation of affinity-%%%purified%%% OPN and BSP from such implants indicated that: (i) the number of mols of phosphoserine (P-Ser)/mol of affinity-%%%purified%%% OPN or BSP varied as a function of implant time and %%%bone%%% formation within both implant sites, and (ii) the 'effective P-Ser concentration' provided by the total OPN and BSP within each implant site varied and increased as a function of time, being approx. 5-fold higher for BSP in calvarial compared with subcutaneous implants. Peak levels of mols of P-Ser/mol of BSP coincided with maximum rates of Ca-P deposition in calvarial implants. Levels of OPN phosphorylation from both calvarial and subcutaneous implants also indicated fluctuations as a function of %%%bone%%% formation. Hence the present study, for the first time, provides direct evidence of natural variation in the extent of phosphorylation of both OPN and BSP as a function of time of mineralized tissue formation. Further evaluation of the data provides the first evidence of a direct and linear relationship between the rate of Ca-P deposition and the ratio of in vivo P-Ser-BSP/P-Ser-OPN for calvarial implants. Data for subcutaneous implants failed to provide such correlation. Overall, the present work demonstrates that the natural biological progression of the process of biomineralization follows strict

criteria consistent with the anatomical location. Biomineralization fails to proceed in the same way in a soft tissue environment.
Record Date Created: 20020523
Record Date Completed: 20020715

2/7/33 (Item 33 from file: 155)
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14538667 PMID: 11895285
Evaluation of pluronic polyols as carriers for grafting materials: study in rat calvaria defects.
Fowler Edward B; Cuenin Michael F; Hokett Steven D; Peacock Mark E; McPherson James C; Dirksen Thomas R; Sharawy Mohamed; Billman Michael A
Periodontics, US Army Dental Activity, Fort Lewis, WA, USA.
Journal of periodontology (United States) Feb 2002, 73 (2) p191-7, ISSN 0022-3492--Print Journal Code: 8000345
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, Non-P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
BACKGROUND: Pluronic polyols are a family of non-ionic surfactants currently used as drug carriers for antibiotic, anti-inflammatory, and anti-neoplastic agents. Therapeutic administration of non-ionic surface-active agents is known to facilitate early collagen synthesis and microcirculation, thus promoting wound healing. The purpose of this study was to determine the in vivo effects of pluronic polyols combined with either an allograft or an alloplast on the healing of critical-sized calvarial defects. METHODS: One hundred fifty (150) adult (95 to 105 days old) male Sprague-Dawley rats weighing between 375 and 425 g were randomly and evenly assigned to each of 15 separate treatment groups and anesthetized, and 8 mm calvarial critical-sized defects were created. Pluronic F-68 (F-68) or pluronic F-127 (F-127) was administered either topically or systemically and in conjuction with %%%deminералized%%% %%%bone%%% powder (DBP), tricalcium phosphate (TCP), or non-grafted controls. Pluronic polyols are easily mixed with either DBP or TCP to improve handling ease. Calvaria were harvested at 12 weeks postsurgery and evaluated histomorphometrically, by contact radiography with subsequent densitometric analysis, through energy spectrometry utilizing a scanning electron microscope, and by fluorescent microscopy. RESULTS: There was a significant difference in the percentage of %%%bone%%% fill among the control, TCP, and DBP only groups, P <0.05. The only significant difference within any of these groups was between the TCP control and TCP plus systemic F-127, P<0.05. CONCLUSIONS: Although there were %%%isolated%%% differences, the overall trend was that the pluronic polyol and the mode of administration did not result in a significant change in %%%bone%%% wound healing as measured by the percentage of %%%bone%%% fill. Pluronic polyols may be considered as carriers for osseous graft materials.
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2/7/34 (Item 34 from file: 155)
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14494364 PMID: 11826657
[Experimental study of periosteal osteoblasts coculture with freeze-dried %%%demineralized%%% %%%bone%%% matrix]
Li Yu-biao, Yang Zhi-ming, Li Xiu-qun
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Zhongguo xiu fu chong jian wai ke za zhi = Zhongguo xiufu chongjian waike zazhi = Chinese journal of reparative and reconstructive surgery (China) Jan 2002, 16 (1) p57-60, ISSN 1002-1692--Print Journal Code: 9425194
Publishing Model Print
Document type: English Abstract; In Vitro; Journal Article; Research Support, Non-U.S. Gov't
Languages: CHINESE
Main Citation Owner: NLM
Record type: MEDLINE; Completed
OBJECTIVE: To investigate the feasibility of freeze-dried %%%demineralized%%% %%%bone%%% matrix (FDBM) as scaffold material in %%%bone%%% tissue engineering. METHODS: Osteoblasts which were %%%isolated%%% from cranial periosteum of New Zealand rabbits were cultured as the seeding cells, then the cells were cocultured with heterogenous FDBM in vitro. The cell-material complex was observed under phase microscope, light microscope and electronic scanning microscope in order to evaluate the interaction between cells and FDBM. RESULTS: Eight hours after coculture, the osteoblasts adhered to FDBM scaffolds. Seven days later, the osteoblasts differentiated and proliferated in FDBM network. Extracellular matrix was secreted and calcium nodes were formed among osteoblasts. CONCLUSION: FDBM is a good scaffold material for the %%%bone%%% tissue engineering.
Record Date Created: 20020205
Record Date Completed: 20030123

2/7/35 (Item 35 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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14475254 PMID: 11787031
A composite graft material containing %%%bone%%% particles and collagen in osteoinduction in mouse.
Tsai Chung-Hung; Chou Ming-Yung; Jonas Mecrehild; Tien Yung-Tico; Chi Emily Y
Department of Pathology, Chung Shan Medical & Dental College, Hospital, Taichung, Taiwan, Republic of China. patholog@mercury.csmc.edu.tw
Journal of biomedical materials research (United States) 2002, 63 (1) p65-70, ISSN 0021-9304--Print Journal Code: 0112726
Publishing Model Print
Document type: Comparative Study; Evaluation Studies; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
%%%Deminералized%%% allogenic %%%bone%%% matrices (DABM) and %%%deminералized%%% freeze-dried %%%bone%%% allograft (DFDBA) have been successfully used as %%%bone%%% -graft materials in the treatment of acquired and congenital cranio-maxillofacial defects and in some orthopedic surgery. However, these %%%bone%%%-graft 'powders' have many shortcomings. For example, placement of particulate graft material in a hemorrhaging site can result in inadequacies or inaccurate attachment as well as loss of the graft materials. To minimize the inadequacies of powderlike graft materials, xenogenic collagen %%%isolated%%% from human tendon, skin, or %%%bone%%% was added to the %%%bone%%%-graft particles to form a composite spongelike implant. This material is commercially available and consists of 60% collagen and 40% DFDBA (DynaGraft, GenSci Co., Irvine, CA). The goal of this study was to evaluate the characteristics of composite graft implants in the mineralization process in an animal model in comparison with DFDBA powder and pure collagen. Seventy-two Swiss Webster mice were divided into three groups: an experimental group implanted with DynaGraft, two comparison groups implanted with either DFDBA or collagen only. All the graft materials were surgically implanted and inserted into the left thigh muscle. Mice were humanely killed at 1, 2, 3, 4, 6, 8, and 12 weeks. Then the muscle tissues in the vicinity of the implants were excised and processed for histology. Paraffin sections were stained with hematoxylin and eosin (H&E), the Von Kossa method, and Masson's trichrome. Some selected specimens were processed for transmission electron microscopic observation. After 1 week of implantation, the DynaGraft group showed calcium deposition on the collagen material and on the periphery of the DFDBA particles. Increased calcification and %%%bone%%%-forming cells were observed at 4-6 weeks. After 8 weeks, the implant formed a calcified nodule and only heavily mineralized connective tissue was observed at the implanted site. The group implanted with DFDBA powder showed calcification around the particulates. The collagen-sponge control group revealed no calcification or %%%bone%%% formation during the period of implantation. The light microscopic findings were confirmed by electron microscopy.

Quantitative radiographic density DynaGraft and DFDBA graft followed sequentially over a period 120 days. It was concluded that a higher rate of calcification and %%%bone%%% formation was produced in the composite graft implant compared to the DFDBA implant. The composite graft material (DynaGraft), which contains both collagen and DFDBA, proved to be more effective for %%%bone%%% formation than particle components alone. Copyright 2002 John Wiley & Sons, Inc.
Record Date Created: 20020111
Record Date Completed: 20020520

2/7/36 (Item 36 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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14444920 PMID: 11771687
Cytocompatibility study of organic matrix extracted from Caribbean coral porites astroides.
Fricain J C; Alouf J; Bareille R; Rouais F; Rouvillain J L
INSERM U 443, Universite Victor Segalen Bordeaux, France.
Biomaterials (England) Feb 2002, 23 (3) p673-9, ISSN 0142-9612--Print Journal Code: 8100316
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Since 1980, natural coral exoskeleton has been widely used as %%%bone%%% graft substitute. Despite numerous in vitro and in vivo studies, there is still a lack of knowledge concerning the organic matrix associated with coral exoskeleton (COM). In fact, some surgical interventions have failed and this has sometimes been attributed to the exoskeleton organic matrix. For others, only amino acids are present in the matrix after coral preparation for clinical use. The objective of this study was to extract the exoskeleton organic matrix to carry out biochemical analysis and study its specific cytocompatibility. %%%Demineralized%%% %%%bone%%% powder (DBP) was used as control. A decalcification process was used to extract COM and DBP. Protein, carbohydrate and glycosaminoglycan analysis was carried out in DBP and COM using classical staining methods. Human %%%bone%%% marrow cells were cultured in the presence of 20, 40, 80, 160 microg of COM or DBP for 24, 48 and 72 h. The methods used to analyze COM and DBP effects were scanning electron microscopy immunocytochemistry, manual cell count, and cyto-compatibility assay (Neutral red and MTT tests). Results showed that in spite of treating coral before clinical use, a COM was present in which GAG, protein and carbohydrate were found. The in vitro cytocompatibility of COM was confirmed for 20 and 40 microg values but was less pronounced for 80 and 160 microg levels.
Record Date Created: 20011228
Record Date Completed: 20020702

2/7/37 (Item 37 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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14310967 PMID: 11680695
Role of cartilage-derived anti-angiogenic factor, chondromodulin-I, during endochondral %%%bone%%% formation.
Shukunami C; Hiraki Y
Department of Molecular Interaction and Tissue Engineering, Institute for Frontier Medical Sciences, Kyoto University, Japan. shukunam@frontier.kyoto-u.ac.jp
Osteoarthritis and cartilage / OARS, Osteoarthritis Research Society (England) 2001, 9 Suppl A pS91-101, ISSN 1063-4584--Print Journal Code: 9305697
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE, Completed
OBJECTIVE: Cartilage is a typical avascular tissue that exhibits powerful resistance to angiogenesis or vascular invasion. We previously identified a cartilage-specific 25 kDa glycosylated protein, chondromodulin-I (ChM-I), as anti-angiogenic factor. Taking advantage of ectopic %%%bone%%% formation and xenograft tumour model by human chondrosarcoma cell line OUMS-27, we examined how ChM-I is involved in switching of angiogenesis in cartilage. DESIGN: Gene expression pattern of ChM-I was examined in 4-week-old mice and mouse embryos by northern blot analysis and in situ hybridization. To evaluate the effect of ChM-I on ectopic %%%bone%%% formation, guanidine extracts of %%%demineralized%%% %%%bone%%% matrix were mixed with the ChM-I-bound heparin-Sepharose beads and were implanted onto the fasciae of back muscle of 6-week old nude mice. To analyse the effect of ChM-I on tumour angiogenesis, the level of ChM-I mRNA in cartilaginous tumours was assessed by competitive PCR, and compared with that of articular cartilage. Then, human chondrosarcoma OUMS-27 cells were inoculated into the back of nude mice to form a tumour about 45 mm3 in size. Recombinant ChM-I protein was administrated into OUMS-27 xenograft tumours for the initial 5 days to study its effect against tumour-angiogenesis. RESULTS: ChM-I gene was specifically expressed in cartilage of 4-week-old mice, Eye and thymus were also identified as minor expression sites. However, during endochondral %%%bone%%% development, cartilage changes its character from anti-angiogenic into angiogenic prior to the replacement of calcified cartilage by %%%bone%%%. In embryos, ChM-I mRNA was expressed in proliferative and upper hypertrophic cartilage zones in the developing cartilaginous %%%bone%%% rudiments, but completely abolished in lower hypertrophic and calcified cartilage zones. %%%Purified%%% ChM-I protein apparently inhibited vascular invasion into cartilage induced by the implantation of %%%demineralized%%% %%%bone%%% matrix in nude mice, leading to the inhibition of replacement of cartilage. The level of ChM-I transcripts in the lower-grade chondrosarcomas was substantially reduced to several hundreds or less in the lower-grade chondrosarcomas, compared with that of articular cartilage or other benign cartilage tumours. The local administration of recombinant human ChM-I almost completely blocked tumour angiogenesis and growth in the human chondrosarcoma xenografts in mice. CONCLUSIONS: ChM-I is involved in the anti-angiogenic property of cartilage and its absence creates a permissive microenvironment for vascular invasion into cartilage under physiological and pathological conditions.
Record Date Created: 20011026
Record Date Completed: 20011207

2/7/38 (Item 38 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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14281703 PMID: 11585346
Spectroscopic characterization of collagen cross-links in %%%bone%%%.
Paschalis E P; Verdelis K; Doty S B; Boskey A L; Mendelsohn R; Yamauchi M
Yamauchi M U NC, Chapel Hill
Mineralized Tissues Section, Hospital for Special Surgery, New York, New York 10021, USA.
Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research (United States) Oct 2001, 16 (10) p1821-8, ISSN 0884-0431--Print Journal Code: 8610640
Contract/Grant No.: AR 41325, AR; United States NIAMS, AR 46121; AR; United States NIAMS, DE10489; DE; United States NIDCR
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, Non-P.H.S.; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Collagen is the most abundant protein of the organic matrix in mineralizing tissues. One of its most critical properties is its cross-linking pattern. The intermolecular cross-linking provides the fibrillar matrices with mechanical properties such as tensile strength and viscoelasticity. In this study, Fourier transform infrared (FTIR) spectroscopy and FTIR imaging (FTIRI) analyses were performed in a series of biochemically characterized samples including %%%purified%%% collagen cross-linked peptides, %%%demineralized%%% bovine %%%bone%%% collagen from

animals of different ages. collagen from vitamin B6-deficient chick homogenized %%%bone%%% and their age- and sex-matched controls, and histologically stained thin sections from normal human iliac crest biopsy specimens. One region of the FTIR spectrum of particular interest (the amide I spectral region) was resolved into its underlying components. Of these components, the relative percent area ratio of two subbands at approximately 1660 cm(-1) and approximately 1690 cm(-1) was related to collagen cross-links that are abundant in mineralized tissues (i.e., pyridinoline [Pyr] and dehydrodihydroxylysinonorleucine [deH-DHLNL]). This study shows that it is feasible to monitor Pyr and DHLNL collagen cross-links spatial distribution in mineralized tissues. The spectroscopic parameter established in the study may be used in FTIR analyses, thus enabling the calculation of relative Pyr/DHLNL amounts in thin (approximately 5 microm) calcified tissue sections with a spatial resolution of approximately 7 microm.
Record Date Created: 20011004
Record Date Completed: 20020226

2/7/39 (Item 39 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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14263313 PMID: 11564904
Incorporation of perforated and %%%demineralized%%% cortical %%%bone%%% allografts. Part II: A mechanical and histologic evaluation.
Lewandrowski K U; Schollmeier G; Ekkernkamp A; Uthhoff H K. Tomford W W
Orthopaedic Research Laboratories, Massachusetts General Hospital, Boston, MA 02114, USA. Lewandrowsky@helix.harvard.edu
Bio-medical materials and engineering (Netherlands) 2001, 11 (3) p209-19, ISSN 0959-2989--Print Journal Code: 9104021
Contract/Grant No.: AR-45062; AR; United States NIAMS
Publishing Model Print
Document type: Comparative Study; Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Laser perforated and partially %%%demineralized%%% cortical %%%bone%%% allografts were orthotopically transplanted into sheep tibiae. This paper reports results of the mechanical testing of the transplanted bones, which was done at nine months postoperatively. Animals were divided into three groups of eight according to the type of cortical allograft used: group 1, no treatment; group 2, laser hole grid; and group 3, laser hole grid and partial demineralization. Thus, changes in flexural rigidity of 24 transplanted whole tibiae were investigated. Starting in the anterior direction at the tibial tuberosity, the flexural rigidity was determined using a nondestructive 4-point bending test. The elliptical distribution of the flexural rigidity was compared to the untreated contralateral control %%%bone%%% of each animal. Mechanical parameters were defined as percentage rates for comparative analysis between groups. Flexural rigidity measurement showed that bones transplanted with untreated allografts were stiffer than contralateral control bones. Partial demineralization of allografts reduced the flexural rigidity of transplanted bones below the level of contralateral control bones. Flexural rigidities of test bones transplanted with laser perforated and partially %%%demineralized%%% allografts were higher than those seen in bones transplanted with partially %%%demineralized%%% allografts. These results were corroborated by the histologic analysis which showed that untreated allografts, although surrounded by a periosteal %%%bone%%% cuff that effectively increased their outer diameter. In contrast, excessive %%%bone%%% resorption was observed in partially %%%demineralized%%% allografts. Laser-perforated and partially %%%demineralized%%% allografts showed histologic evidence of complete incorporation into the host %%%bone%%%. Based on this mechanical evaluation, it was concluded that processing of cortical %%%bone%%% allografts by the combination of perforation and partial demineralization resulted in improved mechanical strength of the transplanted bones as compared to processing by partial demineralization alone.
Record Date Created: 20010920
Record Date Completed: 20011207

2/7/40 (Item 40 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

14263312 PMID: 11564903
Incorporation of perforated and %%%demineralized%%% cortical %%%bone%%% allografts. Part I: radiographic and histologic evaluation.
Lewandrowski K U; Schollmeier G; Ekkernkamp A; Uthhoff H K, Tomford W W
Orthopaedic Research Laboratories, Massachusetts General Hospital, Boston, MA 02114, USA. Lewandrowski@helix.harvard.edu
Bio-medical materials and engineering (Netherlands) 2001, 11 (3) p197-207, ISSN 0959-2989--Print Journal Code: 9104021
Contract/Grant No.: AR-45062; AR; United States NIAMS
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't, Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Massive cortical %%%bone%%% allografts have been found to incorporate slowly into host %%%bone%%%. They are subject to complications such as nonunion, fatigue fracture and infection. In an attempt to improve osteoinduction in cortical %%%bone%%% allografts, laser perforated and partially %%%demineralized%%% cortical %%%bone%%% allografts were orthotopically transplanted into the sheep tibia. In this model, mid-shaft tibial %%%bone%%% allografts from out-bred sheep donor animals were prepared by partial demineralization and drilling of 0.33-mm diameter holes with a pulsed, 2.94-microm wavelength Erbium:Yttrium-Aluminum-Garnet laser. Recipient animals of the same out-bred strain were divided into three groups of eight according to the type of cortical allograft used: group 1, fresh-frozen, no treatment; group 2, laser hole grid; and group 3, laser hole grid and partial demineralization. Plain films were taken in two standard views at monthly intervals. Incorporation was evaluated at nine months postoperatively. Longitudinal radiographic data was correlated to a histologic and morphometric evaluation of each %%%bone%%% graft. Computer tomography was used for the latter analysis. Results showed that untreated allografts, although surrounded by a periosteal %%%bone%%% cuff, were poorly incorporated. Partial demineralization lead to excessive resorption of allografts, but little new %%%bone%%% formation. Laser perforation and partial demineralization induced complete incorporation of allografts into the host %%%bone%%%. Based on the results of the radiographic, histologic and morphometric evaluation, the development of laser-perforated and partially %%%demineralized%%% %%%bone%%% allografts was proposed for clinical use.
Record Date Created: 20010920
Record Date Completed: 20011207

2/7/41 (Item 41 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

14103821 PMID: 11374269
Bovine %%%bone%%% implant with bovine %%%bone%%% morphogenetic protein in healing a canine ulnar defect.
Tuominen T; Jamsa T; Tuukkanen J; Marttinen A; Lindholm T S; Jalovaara P
Department of Surgery, Bone Transplantation Research Group, P.O. Box 5000, University of Oulu, 90014 Oulu, Finland.
International orthopaedics (Germany) 2001, 25 (1) p5-8, ISSN 0341-2695--Print Journal Code: 7705431
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Xenograft is considered an alternative material for %%%bone%%% transplantation, but its %%%bone%%% healing capacity is inferior compared to that of autografts and allografts. Here, we tested whether %%%bone%%%

morphogenetic protein (BMP) addition enhances the suitability of %%%demineralized%%% xenogeneic bovine %%%bone%%% for %%%bone%%% grafting in
dogs, and whether xenogeneic %%%bone%%% is a suitable carrier material for BMPs. The capacity of %%%demineralized%%% bovine %%%bone%%% implants, with and without native partially %%%purified%%% bovine BMP, to heal a 2-cm ulnar defect was determined in six dogs over a follow-up time of 20 weeks. No instances of %%%bone%%% union were seen, but there was slightly more %%%bone%%% formation in the xenografts with BMP, though the difference was not statistically significant. The ulnas treated with an implant with BMP were also mechanically stronger, but the difference was not significant. Computed tomography scans showed no differences in the implant area in %%%bone%%% density, %%%bone%%% mineral content, or %%%bone%%% cross-sectional area. It is concluded that native, partially %%%purified%%% BMP does not sufficiently improve the suitability of bovine %%%demineralized%%% xenografts as a %%%bone%%% substitute material for dog. %%%Demineralized%%% xenogeneic %%%bone%%% does not seem to be a feasible carrier material for BMP.
Record Date Created: 20010525
Record Date Completed: 20011004

2/7/42 (Item 42 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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14075569 PMID: 11336315
A new in vivo model for testing cartilage grafts and biomaterials: the rabbit pinna punch-hole model.
ten Koppel P G; van Osch G J; Verwoerd C D; Verwoerd-Verhoef H L
Department of Otorhinolaryngology, Head and Neck Surgery, Erasmus University Medical Center Rotterdam, The Netherlands.
Biomaterials (England) Jun 2001, 22 (11) p1407-14, ISSN 0142-9612--Print Journal Code: 8100316
Publishing Model Print
Document type: Evaluation Studies; Journal Article; Research Support, Non-U.S. Gov't; Validation Studies
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
In this study an animal model was developed for evaluation of the feasibility of cartilage grafts. In the cartilage of the external ear of the rabbit multiple holes, 6 mm in diameter, were punched, leaving the adherent skin intact. Different experimental groups were evaluated. First, the punch-hole model was validated under various conditions to study spontaneous or perichondrial initiated regeneration of the cartilage defect. When both cartilage and perichondrium was excised no spontaneous repair of the cartilage defect was observed. When perichondrium is present, variable patch-like closure of the punch hole was found. As 'golden standard' a punched out piece of cartilage was reimplanted directly. This condition showed adequate closure of the punch hole, however, no perfect integration of graft and surrounding cartilage was observed. Secondly, to evaluate the 'punch-hole model' a biomaterial, trabecular %%%demineralized%%% bovine %%%bone%%% matrix (DBM), was implanted and tested as a scaffold for tissue engineering techniques in vivo and in vitro. Direct implantation of DBM did not lead to any cartilage formation to close the defect. In vivo engineered cartilage, generated by enveloping DBM in perichondrium for 3 weeks, could adequately close the punch hole. When DBM was seeded with %%%isolated%%% chondrocytes in vitro before implantation in the defect, a highly fragmented graft, with some islets of viable cells was seen. To promote an efficient and reliable evaluation of cartilage grafts a semi-quantitative grading system was developed. Items such as quality, quantity and integrity of the cartilage graft were included in a histomorphological grading system to provide information about the properties of a specific cartilage graft. To validate the grading system, all conditions were scored by two independent observers. An excellent reliability (R = 0.96) was seen between the observers. In summary, the rabbit pinna punch-hole model is a reliable and efficient method for first evaluation of cartilage grafts. The results can be easily analyzed using a semi-quantitative grading system.
Record Date Created: 20010504
Record Date Completed: 20011025

2/7/43 (Item 43 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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14065298 PMID: 11325056
The nature and function of mononuclear cells on the resorbed surfaces of %%%bone%%% in the reversal phase during remodeling.
Domon T; Suzuki R; Takata K; Yamazaki Y; Takahashi S; Yamamoto T; Wakita M
Department of Oral Health Sciences, Hokkaido University Graduate School of Dentistry, Sapporo, Japan.
Annals of anatomy = Anatomischer Anzeiger : official organ of the Anatomische Gesellschaft (Germany) Mar 2001, 183 (2) p103-10, ISSN 0940-9602--Print Journal Code: 100963897
Publishing Model Print
Document type: In Vitro; Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
In a reversal phase of %%%bone%%% remodeling many mononuclear cells appear on the resorbed surfaces of %%%bone%%% with characteristic reversal lines as revealed by transmission electron microscopy (TEM). However, these mononuclear cells have been variously hypothesized or reported. The present study examined the TEM features on the resorbed surfaces of three calcified connective tissues, and aimed to clarify the nature and function of the mononuclear cells in a reversal phase. Dentine slices cultured with %%%isolated%%% osteoclasts, human deciduous teeth, and rat mandibles were used in this study. Specimens were fixed, decalcified, and then embedded in Epon 812, and sectioned into 0.1-microm-thick ultrathin sections. The ultrathin sections were stained with uranyl acetate and lead citrate, and then examined by TEM. Many sharply pointed collagen fibrils with striation were observed exposed on the resorbed surfaces of cultured dentine slices, but there were neither cells nor reversal lines. The same features were observed on the root dentine surfaces of human deciduous teeth. Under many mononuclear cells in a reversal phase of remodeling, reversal lines were seen on the resorbed surfaces of rat mandibles, but there were no striated collagen fibrils exposed on the %%%bone%%% surfaces. The alternation of the TEM features on the resorbed surfaces before and after the participation of mononuclear cells in a reversal phase of remodeling suggests the nature and function of these cells: they participate in both degrading the %%%demineralized%%% and disrupted matrix left on the resorbed surfaces and forming reversal lines there.
Record Date Created: 20010427
Record Date Completed: 20010517

2/7/44 (Item 44 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

13955826 PMID: 15348052
Surface design of orthopaedic drug delivery implants: X-ray photoelectron spectroscopy of %%%bone%%%-derived apatites.
Litvin A L
Laboratory for the Study of Skeletal Disorders and Rehabilitation, Department of Orthopaedic Surgery, Harvard Medical School, Children's Hospital, 300 Longwood Ave, Boston, MA 02115, USA. alitvin@mindspring.com
Journal of materials science. Materials in medicine (United States) Feb 2000, 11 (2) p91-4, ISSN 0957-4530--Print Journal Code: 9013067
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: PubMed not MEDLINE
Incorporation of foreign ions onto a biomineral surface as well as

removal from it of native (physiological) ions during deproteination procedures, are discussed in view of surface design of orthopaedic implants serving as drug delivery carriers. Surface properties of %%%bone%%%-derived apatites, %%%purified%%% at low temperature in non-aqueous medium, and of several commercial samples are examined via XPS technique. It has been demonstrated that, in spite of the fact that the initial %%%bone%%% %%%demineralized%%% matrix is derived from the same bovine %%%bone%%%, different deproteination procedures lead to different surface properties. Correlation between carbon 1s deconvoluted peak and the percentage of the residual organic fraction on the %%%bone%%%-derived apatites' surface at different stages of %%%purification%%% has been established. Copyright 2000 Kluwer Academic Publishers

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Record Date Completed: 20050307

2/7/45 (Item 45 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

13945882 PMID: 11204421

Localization of estrogen receptor beta protein expression in adult human %%%bone%%%.

Braidman I P; Hainey L; Batra G; Selby P L; Saunders P T; Hoyland J A

Musculoskeletal Research Group, University of Manchester Medical School, UK.

Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research (United States) Feb 2001, 16 (2) p214-20, ISSN 0884-0431--Print Journal Code: 8610640

Publishing Model Print

Document type: Journal Article; Research Support, Non-U.S. Gov't

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Evidence suggests that the newly described estrogen receptor beta (ER-beta) may be important for estrogen (17beta-estradiol) action on the skeleton, but its cellular localization in adult human %%%bone%%% requires clarification. We addressed this by using indirect immunoperoxidase with a novel affinity %%%purified%%% polyclonal antibody to human ER-beta, raised to hinge domain (D) sequences from the human receptor. %%%Bone%%% was %%%demineralized%%% in 20% EDTA and all biopsy specimens were formalin-fixed and wax-embedded. Vigorous retrieval was essential for ER-beta detection. In sections (5 microm) of benign prostate hyperplasia, used as positive control, clear nuclear immunoreactivity was seen in glandular epithelial cells, with a 1:500 dilution of ER-beta40. For %%%bone%%% sections, optimal antibody dilutions were 1:100-1:250. We found that in normal %%%bone%%% (from graft operations), in fracture callus from both men and women (>25 years old), pagetic %%%bone%%%, osteophytes, and secondary hyperparathyroid %%%bone%%%, all from older patients, ER-beta was expressed clearly in osteoclast nuclei, with little cytoplasmic immunoreactivity. Nuclear immunoreactivity was still prominent in osteoclasts, with antibody diluted 1:500, although it faded in other cells. Osteoblasts, in areas of active %%%bone%%% formation or %%%bone%%% remodeling, also expressed ER-beta, as did some osteocytes. However, hypertrophic chondrocytes were negative, unlike mesenchymal cells, adjacent to the osteogenesis. Megakaryocytes and some capillary blood vessels cells were receptor positive. All ER-beta expression was blocked totally by preincubation of antibody with antigen. We conclude that ER-beta is expressed in cells of osteoblast lineage and in osteoclasts. The latter appear relatively abundant in this receptor and this might provide a means for direct action of estrogen on osteoclasts.

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Record Date Completed: 20010419

2/7/46 (Item 46 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

13905991 PMID: 11314300

Reconstruction of complex cranial wounds with %%%demineralized%%% %%%bone%%% matrix and bilayer artificial skin.

Shermak M A; Wong L; Inoue N; Nicol T

Division of Plastic and Reconstructive Surgery, Johns Hopkins Bayview Medical Center, 4940 Eastern Avenue, No. A640, Baltimore, Maryland 21224, USA.

Journal of craniofacial surgery (United States) May 2000, 11 (3) p224-31, ISSN 1049-2275--Print Journal Code: 9010410

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Complex wounds involving loss of both cranium and scalp are difficult to reconstruct. Current solutions include both autogenous and alloplastic materials. Tissue engineering provides interesting alternatives for reconstruction of missing %%%bone%%% and soft tissue. %%%Demineralized%%% %%%bone%%% matrix and Integra, artificial bilayer skin substitute, have been used successfully to reconstruct %%%bone%%% and skin as %%%isolated%%% defects, but never in combination. This study investigates the possibility of using %%%demineralized%%% %%%bone%%% matrix in a gel carrier and Integra for combined cranial and scalp defects. The study was divided into two parts. In the first, %%%demineralized%%% %%%bone%%% matrix in the forms of Grafton Flex (n = 12) and Grafton putty (n = 12) was used to reconstruct 15-mm critical size cranial defects in female adult New Zealand White rabbits. In the control group (n = 6), the defect was left empty. The second part of the study investigated the use of Integra and Grafton Flex to reconstruct a 15-mm cranial defect with an overlying full-thickness scalp defect (n = 6). The first study revealed bony healing of the critical-size cranial defect with %%%demineralized%%% %%%bone%%% matrix. The second study demonstrated successful reconstitution of scalp and cranium with both %%%demineralized%%% %%%bone%%% matrix and Integra. We conclude that complex cranial defects involving %%%bone%%% and soft tissue may be successfully reconstructed with their tissue-engineered substrates. %%%demineralized%%% %%%bone%%% matrix (Grafton) and Integra artificial skin.

Record Date Created: 20010420

Record Date Completed: 20010524

2/7/47 (Item 47 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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13752100 PMID: 11010797

Composite autogenous %%%bone%%% and %%%demineralized%%% %%%bone%%% matrices used to repair defects in the parietal %%%bone%%% of rabbits.

Rabie A B; Wong R W; Hagg U

Orthodontics, Faculty of Dentistry, University of Hong Kong, Prince Philip Hospital, Hong Kong.

British journal of oral & maxillofacial surgery (SCOTLAND) Oct 2000, 38 (5) p565-70, ISSN 0266-4356--Print Journal Code: 8405235

Publishing Model Print

Document type: Comparative Study; Journal Article; Research Support, Non-U.S. Gov't

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

We compared the amount of new %%%bone%%% produced by endochondral and intramembranous autogenous %%%bone%%% grafts in the presence of %%%demineralized%%% %%%bone%%% matrices (DBMs) prepared from intramembranous %%%bone%%% (DBM(IM)) or endochondral %%%bone%%% (DBM(EC)).

Thirty-five %%%bone%%% defects were created in the parietal %%%bone%%% of 20 New Zealand White rabbits. In the experimental groups, 5 defects were grafted with endochondral %%%bone%%%, 5 with endochondral %%%bone%%% mixed with DBM(IM)) (EC-DBM(IM)), 5 with intramembranous %%%bone%%% mixed with DBM(IM)(IM-DBM(IM)) and 6 with endochondral %%%bone%%% mixed with DBM(EC)(EC-DBM(EC)). In the control groups, 10 defects were left alone

(passive control) and 4 were grafted with rabbit skin collagen (active control). They were all killed on day 14 and the defects were prepared for histological study. Serial sections were cut across the whole defect. Quantitative analyses were made on 202 sections of the experimental groups by image analysis. A total of 414%, 706%, and 85% more new %%%bone%%% was formed in defects grafted with composite EC-DBM(IM), IM-DBM(IM)and EC-DBM(EC), respectively, than those grafted with endochondral %%%bone%%% alone (P<0.001). No %%%bone%%% was formed in either passive or active controls. In conclusion, %%%demineralized%%% %%%bone%%% matrices, particularly those derived from intramembranous %%%bone%%%, have extremely high osteoinductive properties and greatly improve the integration of autogenous %%%bone%%% grafts in the skull. Copyright 2000 The British Association of Oral and Maxillofacial Surgeons.
Record Date Created: 20010208
Record Date Completed: 20010208

2/7/48 (Item 48 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

13736641 PMID: 10992432
Morphogenesis and tissue engineering of %%%bone%%% and cartilage: inductive signals, stem cells, and biomimetic biomaterials.
Reddi A H
Center for Tissue Regeneration and Repair and Department of Orthopaedic Surgery, University of California, Davis, Medical Center, Sacramento, California, USA. ahreddi@ucdavis.edu
Tissue engineering (UNITED STATES) Aug 2000, 6 (4) p351-9, ISSN 1076-3279--Print Journal Code: 9505538
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Morphogenesis is the developmental cascade of pattern formation, body plan establishment, and the architecture of mirror-image bilateral symmetry of many structures and asymmetry of some, culminating in the adult form. Tissue engineering is the emerging discipline of design and construction of spare parts for the human body to restore function based on principles of molecular developmental biology and morphogenesis governed by bioengineering. The three key ingredients for both morphogenesis and tissue engineering are inductive signals, responding stem cells, and the extracellular matrix. Among the many tissues in the human body, %%%bone%%% has considerable powers for regeneration and is a prototype model for tissue engineering based on morphogenesis. Implantation of %%%demineralized%%% %%%bone%%% matrix into subcutaneous sites results in local %%%bone%%% induction. This model mimics sequential limb morphogenesis and permitted the %%%isolation%%% of %%%bone%%% morphogens. Although it is traditional to study morphogenetic signals in embryos, %%%bone%%% morphogenetic proteins (BMPs), the inductive signals for %%%bone%%%, were %%%isolated%%% from %%%demineralized%%% %%%bone%%% matrix from adults. BMPs and related cartilage-derived morphogenetic proteins (CDMPs) initiate, promote, and maintain chondrogenesis and osteogenesis and have actions beyond %%%bone%%%. The symbiosis of %%%bone%%% inductive and conductive strategies are critical for tissue engineering, and is in turn governed by the context and biomechanics. The context is the microenvironment, consisting of extracellular matrix, which can be duplicated by biomimetic biomaterials such as collagens, hydroxyapatite, proteoglycans, and cell adhesion proteins including fibronectins. Thus, the rules of architecture for tissue engineering are an imitation of the laws of developmental biology and morphogenesis, and thus may be universal for all tissues, including bones and joints. (62 Refs.)
Record Date Created: 20001013
Record Date Completed: 20001013

2/7/49 (Item 49 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

13665140 PMID: 10912526
Chondromodulin-I as a novel cartilage-specific growth-modulating factor.
Hiraki Y; Shukunami C
Department of Molecular Interaction and Tissue Engineering, Institute for Frontier Medical Sciences, Kyoto University, Japan. hiraki@frontier.kyoto-u.ac.jp
Pediatric nephrology (Berlin, Germany) (GERMANY) Jul 2000, 14 (7) p602-5, ISSN 0931-041X--Print Journal Code: 8706728
Publishing Model Print
Document type: Journal Article; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Cartilage is unique among mesenchymal tissues in that it is resistant to vascular invasion due to an intrinsic angiogenesis inhibitor. Chondromodulin-I (ChM-I), a 25-kilodalton glycoprotein %%%purified%%% from bovine epiphyseal cartilage on the basis of growth-promoting activity for chondrocytes, was recently identified as an angiogenesis inhibitor. Human ChM-I cDNA revealed that the mature protein consists of 120 amino acids and is coded as the C-terminal part of a larger transmembrane precursor. Expression of ChM-I cDNA in CHO cells indicated that mature ChM-I molecules were secreted from the cells after post-translational modifications and cleavage from the precursor protein at the predicted processing site. ChM-I stimulated growth and colony formation of cultured chondrocytes, but inhibited angiogenesis in vitro and in vivo. In situ hybridization and immunohistochemistry revealed that ChM-I is specifically expressed in the avascular zone of cartilage in developing %%%bone%%%, but not present in the late hypertrophic and calcified zones that allow vascular invasion. ChM-I actually inhibited vascular invasion into cartilage that was ectopically induced by %%%demineralized%%% %%%bone%%% matrix in nude mice, leading to the suppression of replacement of cartilage by %%%bone%%% in vivo. These results suggest that ChM-I participates in the angiogenic switching of cartilage, and that the withdrawal of its expression allows capillary in-growth, which triggers the replacement of cartilage by %%%bone%%% during endochondral %%%bone%%% development. (23 Refs.)
Record Date Created: 20001023
Record Date Completed: 20001130

2/7/50 (Item 50 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

13665139 PMID: 10912525
%%%Bone%%% morphogenetic proteins and skeletal development: the kidney-%%%bone%%% connection.
Reddi A H
Center for Tissue Regeneration and Repair, Department of Orthopaedic Surgery, University of California, Davis, School of Medicine, Sacramento 95817, USA. ahreddi@ucdavis.edu
Pediatric nephrology (Berlin, Germany) (GERMANY) Jul 2000, 14 (7) p598-601, ISSN 0931-041X--Print Journal Code: 8706728
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The %%%bone%%% morphogenetic proteins (BMPs) are a family of pleiotropic morphogens %%%isolated%%% and cloned from the %%%demineralized%%% extracellular matrix of %%%bone%%%. BMPs and related cartilage-derived morphogenetic proteins (CDMPs) initiate, promote and maintain %%%bone%%% and cartilage. The pleiotropic effects of BMPs are based on concentration-dependent thresholds. Targeted disruption of gene action by homologous recombination has demonstrated the role of BMP 7 in kidney, eye and skeletal development. BMP 7 is critical for kidney tubulogenesis, retinal pigmented epithelium differentiation and skeletal pattern. BMP 7 is also synthesized by the kidney and is detectable in serum; hence BMP 7 is both an autocrine and endocrine morphogen. It is likely renal BMP 7 may

influence skeletal development and growth in children although there may be sources of other BMPs with skeletogenic actions. In conclusion, we are beginning to unravel the mysteries of kidney-%%%bone%%% connection with special reference to pediatric nephrology. (39 Refs.)
Record Date Created: 20001023
Record Date Completed: 20001130

2/7/51 (Item 51 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

13655849 PMID: 10901197
Initiation and promotion of endochrondral %%%bone%%% formation by %%%bone%%% morphogenetic proteins: potential implications for avian tibial dyschondroplasia.
Reddi A H
Center for Tissue Regeneration and Repair, Department of Orthopaedic Surgery University of California, Davis, Sacramento 95817, USA. ahreddi@ucdavis.edu
Poultry science (UNITED STATES) Jul 2000, 79 (7) p978-81, ISSN 0032-5791--Print Journal Code: 0401150
Publishing Model Print
Document type: Journal Article; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The initiation and promotion of %%%bone%%% morphogenesis is regulated by %%%bone%%% morphogenetic proteins. Morphogenesis of the skeleton is the developmental cascade of pattern formation, establishment of mirror-image bilateral symmetry, initiation and promotion of endochondral %%%bone%%% differentiation, and growth culminating in functional weight bearing. Implantation of %%%demineralized%%% %%%bone%%% matrix initiates a developmental cascade of endochondral %%%bone%%% formation that is reminiscent of the sequential %%%bone%%% morphogenesis in the limb bud in the embryo. The inductive agents in the %%%demineralized%%% %%%bone%%% matrix were identified, %%%isolated%%% and cloned, and demonstrated to be %%%bone%%% morphogenetic proteins (BMP). The BMP have been implicated in the pattern formation, differentiation, and regeneration of %%%bone%%%. Because there is a persistent defect in endochondral %%%bone%%% formation in the epiphysed growth plate in tibial dyschondroplasia in poultry, it is likely that BMP signaling mechanisms may be impaired. (37 Refs.)
Record Date Created: 20001025
Record Date Completed: 20001109

2/7/52 (Item 52 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

13603440 PMID: 10836548
Effects of ultraviolet light on free and peptide-bound pyridinoline and deoxypyridinoline cross-links. Protective effect of acid pH against photolytic degradation.
Meddah B; Kamel S; Giroud C; Brazier M
Laboratory of Clinical Pharmacy, Faculty of Pharmacy, Amiens, France.
Journal of photochemistry and photobiology. B, Biology (SWITZERLAND) Feb 2000, 54 (2-3) p168-74, ISSN 1011-1344--Print Journal Code: 8804966
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Little is known about the photodegradation of pyridinoline (Pyd) and deoxypyridinoline (Dpd), which are two mature cross-links stabilizing collagen within extracellular matrix. In this study, highly %%%purified%%% free Pyd and Dpd cross-links have been degraded by irradiation with ultraviolet light and we have shown that photolysis varies with the pH value. Assessment of photolysis in basic (pH 9) and neutral (pH 7) solutions by high-performance liquid chromatography as well as by UV absorbance measurement indicates that both cross-links are degraded after a 24 h UV exposure, while in acidic solution (pH 3) only Dpd is photolysed, suggesting that acid pH provides major protection against Pyd photolysis. Photodegradation products have been studied by amino-acid and mass spectral analysis. Both methods confirm the lack of Pyd degradation in acid pH. Furthermore, amino-acid analysis allows us to identify hydroxylysine and lysine as a result of Pyd and Dpd photolysis, respectively, indicating that the mechanism of photodegradation involves the cleavage of the pyridinium ring on each side of the quaternary nitrogen. Finally, we have also studied the photolysis of different molecular species of type I collagen peptides, obtained by digestion with collagenase of %%%demineralized%%% turkey %%%bone%%%. Our results indicate that even when they are part of the structure of collagen peptide, Pyd and Dpd can be photolysed. However, we have shown that the larger the peptide is, the smaller are the effects of UV irradiation.
Record Date Created: 20001017
Record Date Completed: 20001017

2/7/53 (Item 53 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

13499122 PMID: 10701458
Tissue-engineered cartilage using serially passaged articular chondrocytes. Chondrocytes in alginate, combined in vivo with a synthetic (E210) or biologic biodegradable carrier (DBM).
Marijnissen W J; van Osch G J; Aigner J; Verwoerd-Verhoef H L; Verhaar J A
Department of Orthopaedics, Head and Neck Surgery, Erasmus University Medical Center, Rotterdam, The Netherlands.
Biomaterials (ENGLAND) Mar 2000, 21 (6) p571-80, ISSN 0142-9612--Print Journal Code: 8100316
Contract/Grant No.: N01-HD-6-2915; HD; United States NICHD
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
In vitro multiplication of %%%isolated%%% autologous chondrocytes is required to obtain an adequate number of cells to generate neo-cartilage, but is known to induce cell-dedifferentiation. The aim of this study was to investigate whether multiplied chondrocytes can be used to generate neo-cartilage in vivo. Adult bovine articular chondrocytes, of various differentiation stages, were suspended in alginate at densities of 10 or 50 million/ml, either directly after %%%isolation%%% (P0) or after multiplication in monolayer for one (P1) or three passages (P3). Alginate with cells was seeded in %%%demineralized%%% bovine %%%bone%%% matrix (DBM) or a fleece of polylactic/polyglycolic acid (E210) and implanted in nude mice for 6 weeks. The newly formed tissue was evaluated by Alcian Blue and immunohistochemical staining for collagen type-II and type-I. Structural homogeneity of the tissue, composed of freshly %%%isolated%%% as well as serially passaged cells, was found to be enhanced by high-density seeding (50 million/ml) and the use of E210 as a carrier. The percentage of collagen type-II positive staining P3-cells was generally higher when E210 was used as a carrier. Furthermore, seeding P3-chondrocytes at the highest density (50 million/ml) enhanced collagen type-II expression. This study shows promising possibilities to generate structurally regular neo-cartilage using multiplied chondrocytes in alginate in combination with a fleece of polylactic/polyglycolic acid.
Record Date Created: 20000420
Record Date Completed: 20000420

2/7/54 (Item 54 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

13495497 PMID: 10693546
%%%Bone%%% graft materials. An overview of the basic science.
Bauer T W; Muschler G F
Department of Pathology, Cleveland Clinic Foundation, OH 44195, USA.
Clinical orthopaedics and related research (UNITED STATES) Feb 2000, (371) p10-27, ISSN 0009-921X--Print Journal Code: 0075674
Publishing Model Print
Document type: Journal Article; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Autograft, allograft, and synthetic %%%bone%%% graft substitute materials play an important role in reconstructive orthopaedic surgery, and understanding the biologic effects of these materials is necessary for optimum use. Although vascularized and cancellous autograft show optimum skeletal incorporation, host morbidity limits autograft availability. Experimental studies have confirmed an immune response to allograft %%%bone%%% , but the clinical significance of this response in humans still is unclear. Small amounts of cancellous allograft in humans usually are remodeled completely; large allografts become incorporated by limited, surface intramembranous %%%bone%%% formation suggesting that these graft are primarily osteoconductive. Several synthetic skeletal substitute materials also are osteoconductive, and may show remodeling characteristics similar to allograft. %%%Demineralized%%% %%%bone%%% matrix and some %%%isolated%%% or synthetic proteins can induce endochondral %%%bone%%% formation, and therefore are osteoinductive. The extent and distribution of remodeling of %%%bone%%% graft materials are influenced by many factors, including the quality of the host site and the local mechanical environment (strain). Graft materials are likely to become more specialized for use in specific clinical applications, and composite preparations may soon provide %%%bone%%% graft materials with efficacy that equals or exceeds that of autogenous grafts. (75 Refs.)
Record Date Created: 20000310
Record Date Completed: 20000310

2/7/55 (Item 55 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

13431453 PMID: 10512382
Identification of the chondrogenic-inducing activity from bovine dentin (bCIA) as a low-molecular-mass amelogenin polypeptide.
Nebgen D R; Inoue H; Sabsay B; Wei K; Ho C S; Veis A
Department of Basic and Behavioral Sciences, Northwestern University Dental School, Chicago, Illinois 60611, USA.
Journal of dental research (UNITED STATES) Sep 1999, 78 (9) p1484-94, ISSN 0022-0345--Print Journal Code: 0354343
Contract/Grant No.: DE 01374; DE; United States NIDCR; DE 08525; DE; United States NIDCR; T32 DE 07201; DE; United States NIDCR
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Dentin extracellular matrix has been shown to contain components capable of inducing chondrogenesis and osteogenesis at ectopic sites when implanted in vivo, and chondrogenesis in cultures of embryonic muscle-derived fibroblasts (EMF) in vitro. The polypeptide responsible, called the chondrogenic-inducing agent (CIA), has been %%%isolated%%% from a 4.0-M guanidinium hydrochloride extract of %%%demineralized%%% bovine dentin matrix. Following Sephacryl S-100 chromatography, CIA activity was identified in fractions by assay for uptake of [35S]-SO4 into proteoglycan by the EMF after 24 hrs in culture. The active fraction induced the EMF to produce type II collagen mRNA and decrease production of type I collagen mRNA after 5 days in culture. The EMF CIA, cultured for 4 to 7 wks, formed toluidine-blue- and alizarin-red-stainable nodules, indicative of chondrogenic induction. In vivo implants in rat muscle with collagen carrier produced ectopic %%%bone%%% after 7 wks. The CIA was brought to near-homogeneity by reverse-phase high-performance liquid chromatography, tested at each step by EMF [35S]-SO4-incorporation assays. The CIA components had masses in the ranges of 6000 to 10,000 Da by both mass spectroscopy and gel electrophoresis. The CIA amino acid composition, NH2-terminal, and internal amino acid sequences were determined. These data showed unequivocally that the CIA peptides were derived from bovine amelogenin. The peptides contain the amino-terminal portion of the bovine amelogenin. The presence of these chondrogenic/osteogenic amelogenin-polypeptides in dentin matrix leads us to hypothesize that they may be involved in epithelial-mesenchymal signaling during tooth development interactions-the first time a function has been indicated for these molecules.
Record Date Created: 19991007
Record Date Completed: 19991007

2/7/56 (Item 56 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

13263500 PMID: 10328646
Anorganic bovine %%%bone%%% supports osteoblastic cell attachment and proliferation.
Stephan E B; Jiang D; Lynch S; Bush P; Dziak R
Department of Restorative Dentistry, SUNY at Buffalo School of Dental Medicine, NY 14214, USA.
Journal of periodontology (UNITED STATES) Apr 1999, 70 (4) p364-9, ISSN 0022-3492--Print Journal Code: 8000345
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
BACKGROUND: It was the aim of these studies to examine the ability of an anorganic bovine %%%bone%%% matrix material as an alternative to autogenous %%%bone%%% grafts and %%%demineralized%%% cadaver %%%bone%%% to support the attachment, spreading, and proliferation of %%%isolated%%% osteoblastic cells. METHODS: Primary culture osteoblastic cells were %%%isolated%%% from neonatal rat calvaria by sequential collagenase digestion. In the attachment studies, cells which had been labeled with 3H-leucine were incubated with the matrix material in sterile microfuge tubes for 15, 90, or 180 minutes or 24 hours. The attached cells were released and the radioactivity measured by liquid scintillation spectrometry. In the proliferation experiments, the cells were cultured with the matrix material for 24 hours and 3H-thymidine was added during the last 2 hours of the incubation. The cells were released and the radioactivity measured by liquid scintillation spectrometry. Scanning electron microscopy (SEM) was employed to observe osteoblastic cell interaction with the anorganic %%%bone%%% matrix. In these studies the cells were seeded on the %%%bone%%% graft material, then the material was removed and processed for SEM after 30, 60 or 120 minutes, or 24 or 48 hours. RESULTS: The cells attached to the matrix material in a time-dependent manner. There were significantly (P<0.05) more cells attached after 180 minutes than after the 15 and 90 minute incubations. The matrix material also supported proliferation of the attached osteoblastic cells. Cells seeded onto 100 mg of anorganic bovine %%%bone%%% resulted in significantly (P<0.05) more measurable proliferation than cells seeded onto 10 mg of material. The cells appeared to be round as they attached, then flatten and spread over time. There was also evidence of cellular processes extending into the pores of the material. CONCLUSIONS: These results demonstrate that this anorganic bovine %%%bone%%% graft material is able to support the attachment and proliferation of osteoblastic cells.
Record Date Created: 19990611
Record Date Completed: 19990611

2/7/57 (Item 57 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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13236642 PMID: 10213061

Spatiotemporal pattern of the mouse chondromodulin-I gene expression and its regulatory role in vascular invasion into cartilage during endochondral %%%bone%%% formation.

Shukunami C, Iyama K, Inoue H, Hiraki Y

Department of Molecular Interaction and Tissue Engineering, Institute for Frontier Medical Sciences, Kyoto University, Japan.

International journal of developmental biology (SPAIN) Jan 1999, 43 (1) p39-49, ISSN 0214-6282--Print Journal Code: 8917470

Publishing Model Print

Document type: Journal Article; Research Support, Non-U.S. Gov't

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

During endochondral %%%bone%%% formation, vascular invasion into cartilage initiates the replacement of cartilage by %%%bone%%%. Chondromodulin-I, a 25 kDa glycoprotein %%%purified%%% from bovine epiphyseal cartilage, was recently identified as a novel endothelial cell growth inhibitor. Here we cloned the mouse chondromodulin-I cDNA from a mouse whole embryo cDNA library. Northern blot analysis revealed that the chondromodulin-I transcripts were expressed in association with the formation of cartilage expressing type II collagen from days 11 to 17 of gestation in mouse embryos, at which time cartilaginous %%%bone%%% rudiments were gradually replaced by %%%bone%%%. Chondromodulin-I mRNA was also detected in the thymus and eyes at a lower level. In situ hybridization revealed significant expression in all cartilaginous tissues in the embryos at days 13.5 and 16 of gestation. However, the expression was completely abolished in the hypertrophic cartilage zone prior to calcification. Upon chondrogenic differentiation of mouse ATDC5 cells in vitro, the expression of chondromodulin-I transcripts was induced concomitantly with the formation of type II collagen-expressing chondrocytes. The expression of the transcripts then declined as type X collagen-expressing hypertrophic chondrocytes appeared in the culture. %%%Purified%%% chondromodulin-I protein inhibited the vascular invasion into cartilage ectopically induced by %%%demineralized%%% %%%bone%%% matrix in nude mice, leading to the suppression of %%%bone%%% formation in vivo. These results suggest that chondromodulin-I is involved in the anti-angiogenic property of cartilage, and that the withdrawal of its expression allows the vascular invasion which triggers the replacement of cartilage by %%%bone%%% during endochondral %%%bone%%% development.

Record Date Created: 19990616

Record Date Completed: 19990616

2/7/58 (Item 58 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

13187292 PMID: 10069434

Method for the %%%isolation%%% and %%%purification%%% of pyridinoline and deoxypyridinoline crosslinks from %%%bone%%% by liquid chromatographic techniques.

Meddah B; Kamel S; Giroud C; Brazier M

Laboratoire de Pharmacie Clinique, Faculte de Pharmacie, Amiens, France.

Preparative biochemistry & biotechnology (UNITED STATES) Feb 1999, 29 (1) p63-75, ISSN 1082-6068--Print Journal Code: 9607037

Publishing Model Print

Document type: Comparative Study; Journal Article; Research Support, Non-U.S. Gov't

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Significant progress has been made in recent years in the development of new %%%bone%%% resorption markers, based principally on the urinary excretion of pyridinoline (Pyd) and deoxypyridinoline (Dpd) crosslinks. For their measurement, in spite of the recent development of immunoassays, HPLC remains the method of reference. However, the lack of an appropriate internal standard requires large amounts of pure crosslinks for external standardisation. Herein, we describe an efficient method for the %%%isolation%%% of both crosslinks from %%%bone%%% of adult turkey by isocratic semi-preparative HPLC. %%%Demineralized%%% %%%bone%%% is hydrolysed in hydrochloric acid, 9 M. A first liquid extraction step in butanol allowed to eliminate less polar compounds. The aqueous phase was concentrated and separated by gel filtration on Biogel P2 and eluted by acetic acid solution (10%). Fractions containing pyridinoline were pooled, concentrated, and %%%purified%%% on a CF1 cellulose column. Pyd and Dpd crosslinks were then separated isocratically by HPLC on a C18 reversed phase column (Vydac 218 TP 1010, 250x10 mm) and eluted with HFBA as the ion-pairing agent. Retention times of Pyd and DPD were 23.6 and 28.7 min, respectively. Both crosslinks prepared by HPLC were then transformed as hydrochloride to cellulose phosphate and desalted on Sephadex G-10 columns. These two further steps yielded highly %%%purified%%% compounds (the purity was greater than 98% evaluated by aminoacid analysis). In conclusion, the efficiency of this method allows to obtain rapidly Pyd and Dpd without interfering compounds as proven by spectral studies (NMR and mass spectroscopy).

Record Date Created: 19990503

Record Date Completed: 19990503

2/7/59 (Item 59 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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13094293 PMID: 10667439

Nonsurgical repair of furcal perforations: a literature review.

Bryan E B; Woollard G; Mitchell W C

General dentistry (UNITED STATES) May-Jun 1999, 47 (3) p274-8; quiz 279-80, ISSN 0363-6771--Print Journal Code: 7610466

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

The important steps in the management of a furcal perforation are immediate action, adequate %%%isolation%%%, debridement, and sealing of the defect. Studies have shown that repair materials or underlying matrix material such as amalgam, Cavit, calcium hydroxide, glass ionomers, hydroxylapatite, tricalcium phosphate, and %%%demineralized%%% freeze-dried %%%bone%%% have not been able to produce consistent results. However, current research on new materials such as mineral trioxide aggregate may advance treatment modalities significantly for furcation repair.

Record Date Created: 20000301

Record Date Completed: 20000301

2/7/60 (Item 60 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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13023226 PMID: 10569717

Heterogeneity of the mechanical properties of %%%demineralized%%% %%%bone%%%.

Catanese J; Iverson E P; Ng R K; Keaveny T M

Department of Mechanical Engineering, University of California, Berkeley 94720-1740, USA.

Journal of biomechanics (UNITED STATES) Dec 1999, 32 (12) p1365-9, ISSN 0021-9290--Print Journal Code: 0157375

Contract/Grant No.: AR41481; AR; United States NIAMS

Publishing Model Print

Document type: In Vitro; Journal Article, Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Knowledge of the mechanical properties of the collagenous component of %%%bone%%% is required for composite modeling of %%%bone%%% tissue and for understanding the age- and disease-related reductions in the ductility and strength of %%%bone%%%. The overall goal of this study was to investigate

the heterogeneity of the mechanical properties of %%%demineralized%%% %%%bone%%% which remains unexplained and may be due to differences in the collagen structure or organization or in experimental protocols. Uniaxial tension tests were conducted to measure the elastic and failure properties of %%%demineralized%%% human femoral (n = 10) and tibial (n = 13) and bovine humeral (n = 8) and tibial (n = 8) cortical %%%bone%%%. Elastic modulus differed between groups (p = 0.02), varying from 275 94 MPa (mean SD) to 450 50 MPa. Similarly, ultimate stress varied across groups from 15 4.2 to 26 4.7 MPa (p = 0.03). No significant differences in strain-to-failure were observed between any groups in this study (pooled mean of 8.4 1.6%, p = 0.42). However, Bowman et al. (1996) reported an average ultimate strain of 12.3 0.5% for %%%demineralized%%% bovine humeral %%%bone%%% , nearly 40% higher than our value. Taken together, it follows that all the monotonic mechanical properties of %%%demineralized%%% %%%bone%%% can display substantial heterogeneity. Future studies directed at explaining such differences may therefore provide insight into aging and disease of %%%bone%%% tissue.
Record Date Created: 19991222
Record Date Completed: 19991222

2/7/61 (Item 61 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

12950882 PMID: 9917643
Enhancement of fracture healing with autogenous and allogeneic %%%bone%%% grafts.
Stevenson S
Department of Orthopaedics, Case Western Reserve University, Cleveland, OH, USA.
Clinical orthopaedics and related research (UNITED STATES) Oct 1998, (355 Suppl) pS239-46, ISSN 0009-921X--Print Journal Code: 0075674
Contract/Grant No.: AM22166; AM; United States NIADDK; AM30833; AM; United States NIADDK; AR40547; AR; United States NIAMS
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The factors contributing to a delayed union or nonunion are many. In general they may be divided into three major categories: deficiencies in vascularity and angiogenesis, deficiencies in the robustness of the chondrosseous response, and deficiencies in stability, strain, or physical continuity. Frequently, deficiencies in more than one category are present, thus complicating the approach to therapy. For a %%%bone%%% grafts to enhance fracture healing, it must provide or stimulate that which is deficient. Autogenous fresh cancellous and cortical %%%bone%%% most frequently are used, but other common grafts include allogeneic frozen, freeze dried, or processed allogeneic cortical, corticocancellous and cancellous grafts, and %%%demineralized%%% %%%bone%%% matrix. These grafts have varying capacities to provide active %%%bone%%% formation, to induce %%%bone%%% formation by cells of the surrounding soft tissue, and to serve as a substrate for %%%bone%%% formation. However, the graft cannot exert its biologic activity in %%%isolation%%% , dependent as it is on the surrounding environment for cells to respond to its signals and, in some cases, for blood supply. The mechanical environment of the graft site is also important. Successful graft incorporation requires that an appropriate match must be made between the biologic activity of a %%%bone%%% graft, the condition of the perigraft environment, and the mechanical environment. The task of the clinician who performs a %%%bone%%% grafting procedure for the enhancement of fracture healing is to choose the right graft or combination of grafts for the biologic and mechanical environment into which the graft will be placed. (52 Refs.)
Record Date Created: 19990210
Record Date Completed: 19990210

2/7/62 (Item 62 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

12950866 PMID: 9917627
Initiation of fracture repair by %%%bone%%% morphogenetic proteins.
Reddi A H
Department of Orthopaedic Surgery, University of California at Davis, School of Medicine, Sacramento, USA.
Clinical orthopaedics and related research (UNITED STATES) Oct 1998, (355 Suppl) pS66-72, ISSN 0009-921X--Print Journal Code: 0075674
Publishing Model Print
Document type: Journal Article; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The potential for regeneration and repair of %%%bone%%% is well known. This article conveys the current progress in the realm of %%%bone%%% morphogenetic proteins and their potential for initiating fracture repair cascade. %%%Demineralized%%% %%%bone%%% matrix induces %%%bone%%% formation
and has served as a model for the %%%bone%%% repair cascade. A family of %%%bone%%% morphogenetic proteins has been identified, %%%isolated%%%, and cloned from the %%%demineralized%%% %%%bone%%% matrix. %%%Bone%%% morphogenetic proteins are pleiotropic regulators of chemotaxis, mitosis, and differentiation. The %%%bone%%% morphogenetic protein receptors, Types I and II, bind %%%bone%%% morphogenetic proteins and act in collaboration to transduce the phosphorylation of Smad 1 and Smad 5, which enter the nucleus in partnership with Smad 4 to initiate %%%bone%%% morphogenetic protein responses including fracture healing. The accumulated information on %%%bone%%% morphogenetic proteins may aid in accelerating fracture repair and the potential use of %%%bone%%% morphogenetic protein antibodies to inhibit heterotopic %%%bone%%% formation and fibrodysplasia ossificans progressiva. (61 Refs.)
Record Date Created: 19990210
Record Date Completed: 19990210

2/7/63 (Item 63 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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12684118 PMID: 9609370
Histologic findings after implantation and evaluation of different grafting materials and titanium micro screws into extraction sockets: case reports.
Becker W; Clokie C; Sennerby L; Urist M R; Becker B E
University of Southern California School of Dentistry, Department of Periodontology, Los Angeles, USA.
Journal of periodontology (UNITED STATES) Apr 1998, 69 (4) p414-21, ISSN 0022-3492--Print Journal Code: 8000345
Publishing Model Print
Document type: Clinical Trial; Comparative Study; Controlled Clinical Trial; Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The purpose of this study was to compare extraction socket healing in 8 patients after implantation with either xenogenic bovine %%%bone%%% (n=5 sites), %%%demineralized%%% freeze-dried %%%bone%%% (DFDBA) (n=3 sites), autologous %%%bone%%% (n=3 sites), or human %%%bone%%% morphogenetic proteins in an osteocalcein/osteonectin carrier (hBMP/NCP) (n=2 sites). Three of the patients received 6 commercially pure micro screws which were fixed into extraction sockets, after which the sockets were implanted with either bovine %%%bone%%% (n=3 sites), DFDBA (n=2 sites) or intraoral autologous %%%bone%%% (n=1 site). Biopsies of the extraction sockets were taken from 3 to 6 months after treatment (average, 4.6 months). For comparison of healing between the implanted materials, histologic evaluation and %%%bone%%% scores were determined. %%%Bone%%% scores of 0 indicated an absence of new %%%bone%%%, with dead implanted %%%bone%%% particles entrapped within connective tissue, while a score of 3 indicated

the entire field consisted of vital %%%bone%%%. Biopsies from bovine %%%bone%%% sockets revealed dead implanted particles surrounded by connective tissue. %%%isolated%%% sections showed host %%%bone%%% in contact with the bovine %%%bone%%% particles. %%%Bone%%% scores ranged from 0 to 3. Biopsies from DFDBA-implanted sites revealed dead particles entrapped with dense connective tissue. The %%%bone%%% scores ranged from 0 to 1. Biopsies from sites implanted with hBMP/NCP revealed a combination of woven and lamellar %%%bone%%% with %%%bone%%% scores of 3. Five of the 6 micro screws were processed and evaluated. One screw was mobile at the time of removal and was not evaluated. %%%Bone%%% scores were used to compare new %%%bone%%% formation adjacent to the micro screws. %%%bone%%% scores ranged from 0 to 2. A score of 0 indicated non-vital implant material in contact with host %%%bone%%% and connective tissue in contact with implant; 2 indicated vital %%%bone%%% in contact with the majority of the implant surface. Retrieved sockets with micro screws implanted with bovine %%%bone%%% (n=2) demonstrated a connective tissue interface between the screws and the surrounding tissues (%%%bone%%% score 0). The adjacent tissues showed dead bovine particles entrapped within fibrous tissue. Retrieved screws implanted with DFDBA (n=2) were surrounded by connective tissue, with dead %%%bone%%% particles enmeshed within fibrous tissue (%%%bone%%% score 0). The screw implanted with intra-oral autologous %%%bone%%% was primarily surrounded by vital %%%bone%%% with a connective tissue interface (%%%bone%%% score 1). Three implant threads were in contact with %%%bone%%%. The results of this study indicate that bovine %%%bone%%%, DFDBA, and intraoral autologous %%%bone%%% do not promote extraction socket healing. Sockets implanted with hBMP/NCP contained vital woven and lamellar %%%bone%%%. Xenogenic bovine %%%bone%%% and DFDBA did not contribute to %%%bone%%% to micro screw contacts and are not recommended for enhancement of vital %%%bone%%% to implant contacts. Intraoral autogenous %%%bone%%% also does not appear to significantly contribute to %%%bone%%% to implant contacts. Intraoral autologous %%%bone%%%, xenogenic %%%bone%%%, and DFDBA appear to interfere with normal extraction socket healing.
Record Date Created: 19980707
Record Date Completed: 19980707

2/7/64 (Item 64 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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12679502 PMID: 9602778
Ethene oxide and %%%bone%%% induction. Controversy remains.
Aspenberg P; Lindqvist S B
Department of Orthopedics, Lund University Hospital, Sweden. P.Aspenberg@ort.lu.se
Acta orthopaedica Scandinavica (NORWAY) Apr 1998, 69 (2) p173-6, ISSN 0001-6470--Print Journal Code: 0370352
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
There is controversy as to whether ethene oxide ("ethylene oxide", EO) sterilization destroys the %%%bone%%%-inducing capacity of %%%demineralized%%% %%%bone%%% matrix (DBM) or not. Correctly performed studies seem to support both opinions. %%%Bone%%% conductive properties of fresh frozen, defatted %%%bone%%% grafts are greatly impaired by EO sterilization, whereas %%%purified%%% inductive proteins resist EO. Studies showing destruction of osteoinductive capacity used nonpulverized DBM, whereas the others used powder. This could be the key to resolving the controversy, because if EO treatment reduces the cells' ability to penetrate a cortical graft and to reach inductive proteins inside it, it may appear noninductive after EO sterilization, even though BMP molecules may be intact. On the other hand, cells could easily penetrate the powder implants. We compared the effect of EO sterilization on the inductive capacity of %%%demineralized%%% cortical %%%bone%%% with that of DBM powder, using allogeneic material in rats. Cortical pieces lost all inductive capacity by EO sterilization, whereas the powder yielded a calcium content which was at best one fourth of the unsterilized. The concentrations of residual EO, ethene chlorohydrin and ethene glucol at implantation were far below approved levels. Another difference between studies is the humidity during EO treatment. In our hands, humidification reduced %%%bone%%% yield by half. In conclusion, EO sterilization may impair the biological performance of %%%bone%%% inductive implants by reducing cell penetration into bulk material. However, DBM powder, when correctly sterilized, also yielded scanty amounts of %%%bone%%%.
Record Date Created: 19980610
Record Date Completed: 19980610

2/7/65 (Item 65 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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12615770 PMID: 9528003
Role of morphogenetic proteins in skeletal tissue engineering and regeneration.
Reddi A H
Center for Tissue Regeneration and Repair, University of California-Davis, Medical Center, Sacramento 95817, USA. ahreddi@ucdavis.edu
Nature biotechnology (UNITED STATES) Mar 1998, 16 (3) p247-52, ISSN 1087-0156--Print Journal Code: 9604648
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Morphogenesis is the developmental cascade of pattern formation and body plan establishment, culminating in the adult form. It has formed the basis for the emerging discipline of tissue engineering, which uses principles of molecular developmental biology and morphogenesis gleaned through studies on inductive signals, responding stem cells, and the extracellular matrix to design and construct spare parts that restore function to the human body. Among the many organs in the body, %%%bone%%% has considerable powers for regeneration and is a prototype model for tissue engineering. Implantation of %%%demineralized%%% %%%bone%%% matrix into subcutaneous sites results in local %%%bone%%% induction. This model mimics sequential limb morphogenesis and has permitted the %%%isolation%%% of %%%bone%%% morphogens, such as %%%bone%%% morphogenetic proteins (BMPs), from %%%demineralized%%% adult %%%bone%%% matrix. BMPs initiate, promote, and maintain chondrogenesis and osteogenesis, but are also involved in the morphogenesis of organs other than %%%bone%%%. The symbiosis of the mechanisms underlying %%%bone%%% induction and differentiation is critical for tissue engineering and is governed by both biomechanics (physical forces) and context (microenvironment/extracellular matrix), which can be duplicated by biomimetic biomaterials such as collagens, hydroxyapatite, proteoglycans, and cell adhesion glycoproteins, including fibronectins and laminin. Rules of tissue architecture elucidated in %%%bone%%% morphogenesis may provide insights into tissue engineering and be universally applicable for all organs/tissues, including bones and joints. (66 Refs.)
Record Date Created: 19980513
Record Date Completed: 19980513

2/7/66 (Item 66 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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12581766 PMID: 9527561
Long-term maintenance of alveolar %%%bone%%% gain after implantation of autolyzed, antigen-extracted, allogenic %%%bone%%% in periodontal intraosseous defects.
Flemming T F; Ehmke B; Bolz K; Kubler N R; Karch H; Reuther J F; Klaiber B
Department of Periodontology, Julius Maximilian University, Wurzburg, Germany. tflemmig@psychologie.uni-wuerzburg.de
Journal of periodontology (UNITED STATES) Jan 1998, 69 (1) p47-53,

ISSN 0022-3492--Print Journal Code: 8000345
Publishing Model Print
Document type: Clinical Trial; Comparative Study; Journal Article; Randomized Controlled Trial
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
This randomized controlled trial assessed the long-term maintenance of alveolar %%%bone%%% gain after implantation of autolyzed, antigen-extracted, allogenic (AAA) %%%bone%%%. AAA %%%bone%%% is a %%%demineralized%%% freeze-dried %%%bone%%% allograft processed after previously described methods. In each of 14 patients, AAA %%%bone%%% was implanted into the intraosseous defect of 1 tooth (test), a second tooth with an intraosseous defect was treated by modified Widman flap surgery alone (control). All patients were offered supportive periodontal therapy at 3- to 6-month intervals following treatment. Clinical measurements were taken prior to surgery, 6 months, and 3 years following surgery. Of the 14 patients enrolled, 11 patients completed the 6-month and 8 patients the 3-year examination. In test teeth, %%%bone%%% gain was significantly greater compared to control teeth at 6 months (2.20.5 mm and 1.20.5 mm, respectively) and 3 years (2.30.7 mm and 1.10.8 mm, respectively) ($P < 0.05$). Also, more probing attachment was gained in test compared to control teeth at 3 years (2.00.7 mm and 0.80.5 mm, respectively; $P < 0.05$). At 3 years, Porphyromonas gingivalis was detected in 3 test and 2 control teeth by polymerase chain reaction, whereas no Actinobacillus actinomycetemcomitans was found. Due to the low detection frequency, there was no clear correlation between the maintenance of alveolar %%%bone%%% during supportive periodontal therapy and subgingival infection with P. gingivalis. The data indicated that alveolar %%%bone%%% gain after implantation of AAA %%%bone%%% may be maintained over a minimum of 3 years in patients receiving periodontal supportive therapy.
Record Date Created: 19980327
Record Date Completed: 19980327

2/7/67 (Item 67 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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12573319 PMID: 9462758
A new in utero sheep model for unilateral coronal craniosynostosis.
Stelnicki E J; Vanderwall K; Hoffman W Y; Harrison M R; Glowacki J; Longaker M T
Department of Plastic Surgery, University of California San Francisco, USA.
Plastic and reconstructive surgery (UNITED STATES) Feb 1998, 101 (2) p278-86, ISSN 0032-1052--Print Journal Code: 1306050
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Several animal models have been designed in the past to analyze the pathophysiology and management of craniosynostosis, very few of which were intrauterine. Those that were interuterine had problems with either a short gestation or limited availability that prevented most researchers from using them in treatment analysis. We desired to create a biologically sound intrauterine model of craniosynostosis, using an animal with a long gestation and an early calvarial %%%bone%%% formation, which was easy to manipulate in utero, that could be created by any researcher studying this disorder. Using biologic data available regarding growth factors thought to be involved in %%%bone%%% growth and cranial suture closure, we developed a new in utero fetal lamb model for the study of craniosynostosis. Ten 70-day gestation fetal lambs (term gestation 140 days) received a midline coronal incision to expose both coronal sutures. The entire right coronal suture was then excised along with a 4-mm bony margin. In each animal, the site was packed with 25 mg of %%%demineralized%%% sheep %%%bone%%% powder augmented with 50 microg of %%%bone%%% morphogenetic protein-2 (BMP-2) and 1 microg of poly-transforming growth factor-beta. The scalp was closed, and the sheep were returned to the uterus until either 90 or 140 days of gestation. Complete fusion of the right coronal suture occurred in all fetuses by 90 days gestation. In every animal, right-sided frontal %%%bone%%% flattening and supraorbital rim elevation were evident. Histologic analysis showed bony synostosis at the suture site without evidence of suture regeneration. By 140 days, this %%%isolated%%% suture fusion led to marked craniofacial abnormalities including right supraorbital rim elevation, significant frontal %%%bone%%% flattening, a decrease in the anterior-posterior length of the cranial vault, and flattening of the cranial base. In conclusion, we have developed a new model for the study of the secondary effects induced by the process of cranial suture fusion, which produces abnormalities seen in naturally occurring cases of %%%isolated%%% right coronal suture synostosis. In addition, this model confirms that %%%isolated%%% coronal suture fusion alone can lead to the multiple cranial and facial abnormalities seen with this disorder, even in the absence of associated cranial base suture fusions.
Record Date Created: 19980304
Record Date Completed: 19980304

2/7/68 (Item 68 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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12514955 PMID: 9512885
Identification of lysyl oxidase and TRAMP as the major proteins in dissociative extracts of the %%%demineralized%%% collagen matrix of porcine dentine.
Domenicucci C; Goldberg H A; Sodek J
Medical Research Council Group in Periodontal Physiology, Faculty of Dentistry, University of Toronto, Ontario, Canada.
Connective tissue research (ENGLAND) 1997, 36 (3) p151-63, ISSN 0300-8207--Print Journal Code: 0365263
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Carbonated apatite (dahllite) is formed within and between collagen fibrils in the mineralization of connective tissues. However, the mechanism of crystal nucleation at these sites has not been resolved. To identify non-collagenous proteins that may be involved in the nucleation process we have utilized a dissociative extraction procedure to %%%isolate%%% proteins associated non-covalently with the de-mineralized collagen matrix of dentine %%%isolated%%% from tooth roots of adult porcine incisors. Following extraction of dentine fragments with 4M GuHCl (G1-extract) and 0.5M EDTA (E-extract), de-mineralized collagen matrix-associated proteins were %%%isolated%%% with a second series of extractions with 4M GuHCl (G2-extract). Analysis of the G2-extracts on SDS-PAGE revealed two major 32 kDa and 24 kDa protein bands, comprising > 80% of the extracted non-collagenous proteins. The 32 kDa protein was %%%purified%%% by FPLC on hydroxyapatite and Mono Q resins, followed by HPLC reverse-phase chromatography. Small amounts of 28 kDa and 6 kDa proteins, which appear to represent proteolytically processed, disulphide-linked fragments of the 32 kDa protein, co-eluted with the major protein. The 32 kDa protein was identified as lysyl oxidase from amino acid sequence analysis of a 13 kDa CNBr peptide obtained from protein %%%purified%%% by preparative electrophoresis on SDS-PAGE. Fractionation of the 24 kDa protein on FPLC Mono Q resin generated < 5 closely eluting protein peaks. The proteins from these peaks were similar in size, staining properties, amino acid composition and CNBr digestion patterns. Each protein was immunoreactive with antibodies raised against a tyrosine-rich acidic matrix protein (TRAMP), reported previously to co-%%%purify%%% with lysyl oxidase. These studies, therefore, show that lysyl oxidase, which is important in collagen cross-link formation, and proteins with properties of TRAMP, a protein that can modulate collagen fibrillogenesis, are the major proteins in dissociative extracts of de-mineralized porcine dentine.
Record Date Created: 19980505
Record Date Completed: 19980505

2/7/69 (Item 69 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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12506860 PMID: 9483923
[Osteoinduction and -reparation]
Osteoinduktion und -reparation.
Kubler N R
Klinik und Poliklinik fur Mund-, Kiefer-, Gesichtschirurgie, Bayerische Julius-Maximilians-Universitat Wurzburg.
Mund-, Kiefer- und Gesichtschirurgie - MKG (GERMANY) Feb 1997, 1 (1) p2-25, ISSN 1432-9417--Print Journal Code: 9716576
Publishing Model Print
Document type: English Abstract; Journal Article; Research Support, Non-U.S. Gov't; Review
Languages: GERMAN
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Traumata, diseases, developmental deformities, and tumor resections frequently cause %%%bone%%% defects and atrophies. In general, three different mechanisms exist by which %%%bone%%% restoration can be achieved: (1) osteogenesis initiated by vital, osteoblastic cells of autografts; (2) osteoconduction (or creeping substitution); and (3) osteoinduction. The latter mechanism means the differentiation of pluripotent, mesenchymal-type cells (located in a recipient bed with strong regenerative capacity) into cartilage- and %%%bone%%%-forming progenitor cells under the influence of inductive %%%bone%%% morphogenetic proteins (BMPs). Some BMPs are physiologically included in low concentrations as organic components in %%%bone%%% tissue. They can diffuse from %%%demineralized%%% %%%bone%%% implants into the recipient bed and induce a differentiation into new %%%bone%%% tissue. Nine different BMPs have been %%%isolated%%%, characterized, and cloned. Some of these possess inductive properties and can initiate new %%%bone%%% formation in muscle tissue or in %%%bone%%% defects. In the future recombinant BMPs will be available in unlimited quantities. This will lead to completely new therapeutic concepts in reconstructive %%%bone%%% surgery. (298 Refs.)
Record Date Created: 19980406
Record Date Completed: 19980406

2/7/70 (Item 70 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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12431420 PMID: 9368181
Human %%%bone%%% marrow-derived mesenchymal (stromal) progenitor cells (MPCs) cannot be recovered from peripheral blood progenitor cell collections.
Lazarus H M, Haynesworth S E, Gerson S L, Caplan A I
Department of Medicine, Ireland Cancer Center of University Hospitals of Cleveland, Case Western Reserve University, Ohio 44106, USA.
Journal of hematotherapy (UNITED STATES) Oct 1997, 6 (5) p447-55, ISSN 1061-6128--Print Journal Code: 9306048
Contract/Grant No.: M01RR00080; RR; United States NCRR; R01AG11331; AG; United States NIA; R01DE07220; DE; United States NIDCR;
Publishing Model Print
Document type: Comparative Study; Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The purpose of this study was to compare the ability to collect human %%%bone%%% marrow-derived mesenchymal (stromal) progenitor cells (MPC) from %%%bone%%% marrow versus peripheral blood hematopoietic progenitor cell (PBPC) collections using in vitro and in vivo assays. Ten milliliter samples of PBPC collections mobilized from 11 patients undergoing autotransplants using chemotherapy followed by G-CSF 5-10 micrograms/kg were evaluated using in vitro and in vivo assays for hematopoietic progenitors and MPCs. Additionally, 10 ml samples of unstimulated %%%bone%%% marrow aspirates as well as PBPC collected after mobilization using G-CSF 10 micrograms/kg obtained from 3 normal, histocompatible allogeneic donors were analyzed for hematopoietic progenitors and MPCs. The MPCs were %%%isolated%%% and culture-expanded as adherent cells in vitro and subsequently tested for the capacity to differentiate into mesenchymal phenotypes in vivo using calcium hydroxyapatite porous ceramic cubes implanted s.c. in athymic mice. %%%Demineralized%%% sections of these cubes were analyzed histologically for the appearance of %%%bone%%% and cartilage. Seven autotransplant subjects with cancer received G-CSF after chemotherapy administration, whereas 4 cancer patients and all 3 normal donors received G-CSF alone as the mobilizing regimen. For the autologous PBPC collections and the normal marrow aspirations, median hematopoietic progenitor content was in the normal range for our institution. MPCs were detected in in vitro cultures and as %%%bone%%%-positive ceramic cubes in samples of all 3 allogeneic donor %%%bone%%% marrows but in none of the 14 autologous and 6 allogeneic PBPC collections. In conclusion, MPCs could not be recovered in PBPC collections obtained from either normal donors or patients who underwent PBPC collections after mobilization therapy but could be obtained routinely from %%%bone%%% marrow samples. Although the role of transplanted MPCs is an area of clinical investigation, this study points out a fundamental differences in the population of cells transplanted after collection from %%%bone%%% marrow versus peripheral blood.
Record Date Created: 19971230
Record Date Completed: 19971230

2/7/71 (Item 71 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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12251294 PMID: 9174660
Bone morphogenetic proteins: an unconventional approach to isolation of first mammalian morphogens.
Reddi A H
Department of Orthopedic Surgery, Johns Hopkins Oncology Center, Johns Hopkins University School of Medicine, Baltimore, MD 21205, USA. ahr@welchlink.welch.jhu.edu
Cytokine & growth factor reviews (ENGLAND) Mar 1997, 8 (1) p11-20, ISSN 1359-6101--Print Journal Code: 9612306
Contract/Grant No.: CA-58236; CA; United States NCI; DE-10712; DE; United States NIDCR
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
It is conventional to identify morphogens from fly and frog embryos during morphogenesis using gene-screens, subtractive hybridizations, differential displays and expression cloning. This information is then extended to mice and men. The bone morphogenetic proteins (BMPs) are a family of pleiotropic morphogens/cytokines isolated and cloned from the demineralized extracellular matrix of adult %%%bone%%%. Thus, BMPs were %%%isolated%%% from mammalian %%%bone%%% by an unconventional approach. BMPs initiate the sequential developmental cascade of %%%bone%%% morphogenesis in ectopic sites. The pleiotropic effects of BMPs on chemotaxis, mitosis and differentiation are based on concentration-dependent thresholds. Recent work has demonstrated the critical role of BMPs in pattern formation in amphibian and chick limb development. Targeted disruption of gene function by homologous recombination has demonstrated the actions of BMPs beyond %%%bone%%% in such disparate tissues as kidney, eye, testis, teeth, skin and heart. The successful %%%isolation%%% of first mammalian morphogens has laid the foundation for the elucidation of molecular signalling during morphogenesis in bones and beyond. (64 Refs.)
Record Date Created: 19970811
Record Date Completed: 19970811

2/7/72 (Item 72 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

12196803 PMID: 9101451
Producing vascularized %%%bone%%% by heterotopic %%%bone%%% induction and guided tissue regeneration: a silicone membrane-%%%isolated%%% latissimus dorsi island flap in a rat model.
Viljanen V V, Gao T J, Lindholm T S
Bone Transplantation Research Group, University Central Hospital of Tampere, Finland.
Journal of reconstructive microsurgery (UNITED STATES) Apr 1997, 13 (3) p207-14, ISSN 0743-684X--Print Journal Code: 8502670
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Transformation of mesenchymal-type tissue into cartilage and %%%bone%%% can be induced by %%%bone%%% morphogenetic protein, and by its parent substratum, %%%demineralized%%% %%%bone%%% matrix. The authors were interested in transforming muscle island flaps into vascularized %%%bone%%% that could be used as autogeneic skeletal replacement parts. In Wistar rats, tubular latissimus dorsi muscle island flaps were created, using microsurgical techniques. The flaps were inserted by a cylinder of %%%demineralized%%% %%%bone%%% matrix (DBM) and enclosed in silicone rubber membrane tubes. The animals were followed-up for 10, 21, or 35 days. Rats with DBM implanted in muscle pouches served as controls. Quantitative radiomorphometry and qualitative histology were performed. A statistically significant linear time-related increase in radiomorphometrically-measured calcified tissue was found in the flaps with DBM from 10 days to 5 weeks. At 3 and 5 weeks, lamellar and cancellous %%%bone%%% with fully developed marrow was detected microscopically. There was no significant difference in %%%bone%%% quantity in the island flaps after 35 days, compared with the muscle pouches implanted with DBM, although the difference at 21 days was still significantly in favor of the island flaps. Using allogeneic DBM in rat muscle island flaps surrounded with a silicone membrane, it was possible to generate in vivo autogenous new %%%bone%%% with a good vascular supply and good mobility, allowing later transfer to another site. The experiment provided a basic technique that can be used as a standard in testing various osteoinductive substances for the production of vascular-pedicled new %%%bone%%%.
Record Date Created: 19970605
Record Date Completed: 19970605

2/7/73 (Item 73 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

12176764 PMID: 9075634
X-ray pole figure analysis of apatite crystals and collagen molecules in %%%bone%%%.
Sasaki N; Sudoh Y
Division of Biological Sciences, Graduate School of Science, Hokkaido University, Kita-Ku Sapporo 060, Japan.
Calcified tissue international (UNITED STATES) Apr 1997, 60 (4) p361-7, ISSN 0171-967X--Print Journal Code: 7905481
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
X-ray pole figure analysis was performed on apatite (AP) crystals in %%%bone%%% mineral and collagen molecules in the %%%bone%%% matrix. For AP in %%%bone%%% mineral, the (0002) plane (c-axis) and (2130) plane were examined. The diffraction peaks from both planes were well %%%isolated%%% from other diffraction peaks in the %%%bone%%%. To investigate the orientation of collagen molecules in the %%%bone%%% matrix, %%%demineralized%%% %%%bone%%% by EDTA treatment was used. For collagen, the diffraction peak from about the 0.3 nm period along the helix axis of the collagen molecule was investigated. The c-axis of AP and the helical axis of the collagen molecule have strongly preferred orientations in a direction parallel to the %%%bone%%% axis. The c-axis of AP has an appreciable pole density peak in the radial and tangential direction of the %%%bone%%%, whereas collagen molecules were almost uniaxially oriented in the %%%bone%%% axis direction though having an appreciable distribution. This suggests that there are more than two types of morphology in the AP particle in %%%bone%%% mineral: one with the c-axis almost parallel to the %%%bone%%% axis and the other in which the c-axis is oriented almost perpendicular to the %%%bone%%% axis. The (2130) plane has %%%isolated%%% peaks of pole density in pole figures in both radial and tangential directions. On the basis of the classification of orientation for elongated polyethylene, the main portion of AP particles in %%%bone%%% is concluded to be biaxially oriented.
Record Date Created: 19970707
Record Date Completed: 19970707

2/7/74 (Item 74 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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12018322 PMID: 8998877
Use of %%%demineralized%%% %%%bone%%% matrix in hindfoot arthrodesis.
Michelson J D, Curl L A
Johns Hopkins Outpatient Center, Baltimore, MD 21287-0881, USA.
Clinical orthopaedics and related research (UNITED STATES) Apr 1996, (325) p203-8, ISSN 0009-921X--Print Journal Code: 0075674
Publishing Model Print
Document type: Clinical Trial; Comparative Study; Journal Article; Randomized Controlled Trial; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Fifty-five patients considering a hindfoot fusion performed by the senior author over a 5-year period were given the choice of having the fusion augmented by either iliac crest %%%bone%%% graft or %%%demineralized%%% %%%bone%%% graft in a study of the relative efficacy of these 2 methods of %%%bone%%% grafting. Eleven patients underwent subtalar fusion (average age, 40.1 14.0 years), and 44 had a triple arthrodesis (average age, 54.6 19.2 years). The most common indications for surgery were posterior tibial tendon insufficiency and traumatic arthritis. There were no significant differences between groups regarding underlying disease, medications, or associated medical conditions. In %%%isolated%%% subtalar fusions, all 3 patients who received an iliac crest %%%bone%%% graft experienced healing, as did 7 of 8 patients who received %%%demineralized%%% %%%bone%%% graft. The eighth patient had a radiographic non-union without clinical symptoms. Complete healing of triple arthrodeses was achieved in 13 of 15 patients who received an iliac crest %%%bone%%% graft and in 29 of 29 patients receiving a %%%demineralized%%% %%%bone%%% graft. There were no intergroup differences in the time to union, which generally was between 3 and 4 months. Intraoperative blood loss was significantly less with %%%demineralized%%% %%%bone%%% graft (33 25 ml) than with iliac crest %%%bone%%% graft (206 192 ml). This study demonstrated that %%%demineralized%%% %%%bone%%% graft aids arthrodesis at least as well as does iliac crest %%%bone%%% graft, without the increased blood loss, cost, and postoperative pain associated with iliac crest %%%bone%%% harvest. (24 Refs.)
Record Date Created: 19970123
Record Date Completed: 19970123

2/7/75 (Item 75 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

11988514 PMID: 8915778
%%%Demineralized%%% %%%bone%%% matrix mediates differentiation of

%%%bone%%% marrow stromal cells in vitro: effect of age of cell donor.
Becerra J, Andrades J A, Ertl D C, Sorgente N, Nimni M E
Division of Surgical Research, Children's Hospital Los Angeles, University of Southern California, USA.
Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research (UNITED STATES) Nov 1996, 11 (11) p1703-14, ISSN 0884-0431--Print Journal Code: 8610640
Contract/Grant No.: AGO2577; AG; United States NIA
Publishing Model Print
Document type: Journal Article, Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE, Completed
%%%Bone%%% maintenance requires a continuous source of osteoblasts throughout life. Its remodeling and regeneration during fracture repair is ensured by osteoprogenitor stem cells which are part of the stroma of the %%%bone%%% marrow (BM). Many investigators have reported that in cultured BM stromal cells there is a cell population that will differentiate along an osteogenic lineage if stimulated by the addition of osteogenic inducers, such as dexamethasone (dex), beta-glycerophosphate (beta-GP), transforming growth factor beta-1 (TGF-beta 1) and %%%bone%%% morphogenetic protein-2 (BMP-2). Here we report the effects of %%%demineralized%%% %%%bone%%% matrix (DBM) on the osteogenic differentiation of BM stromal cells in vitro, using morphological criteria, alkaline phosphatase (AP) activity, and calcium accumulation. DBM and DBM-conditioned medium (DBMcm) enhanced %%%bone%%% formation in the presence of dex and beta-GP, whereas DBM particles caused changes in the cell phenotype. Temporal expression of total and skeletal AP by BM stromal cells from 4-week-old rats showed a biphasic pattern enhanced by DBM and suggesting the presence of two cell populations. In one population, AP synthesis reaches a maximum during the first week in culture, following which cells either die or loose their ability to synthesize AP. A second, less abundant population begins to proliferate and synthesize AP during the second and third weeks. The synthesis of AP, which often decreases by the third week, can be maintained at high levels only if DBM is added to the cultures. BM stromal cells %%%isolated%%% from 24- and 48-week-old rats showed a decrease or loss of this biphasic AP expression pattern compared with cells %%%isolated%%% from 4-week-old rats. The addition of DBM to cultures derived from 24- and 48-week-old rats stimulated mostly the second cell population to synthesize AP, suggesting that DBM contains a factor(s) that acts on a specific %%%bone%%% marrow cell population by increasing the proliferation of active cells or inducing the differentiation of dormant cells.
Record Date Created: 19970311
Record Date Completed: 19970311

2/7/76 (Item 76 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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11975488 PMID: 8900119
Molecular site specificity of pyridinoline and pyrrole cross-links in type I collagen of human %%%bone%%%.
Hanson D A, Eyre D R
University of Washington,Department of Orthopaedics. Seattle, Washington 98195, USA.
Journal of biological chemistry (UNITED STATES) Oct 25 1996, 271 (43) p26508-16, ISSN 0021-9258--Print Journal Code: 2985121R
Contract/Grant No.: AR37318; AR; United States NIAMS
Publishing Model Print
Document type: Journal Article, Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE, Completed
Compared with soft tissue collagens, %%%bone%%% type I collagen displays a distinctive pattern of covalent cross-linking, with evidence of preferred sites of molecular interaction and a prominence of both immature, divalent cross-links and mature, trivalent cross-links in the adult tissue. In this study the site-specificity of the mature cross-links in human %%%bone%%% collagen was examined. Peptides containing fluorescent pyridinoline cross-links and Ehrlich's-reactive pyrrole cross-links were %%%isolated%%% from a bacterial collagenase digest of %%%demineralized%%% %%%bone%%% matrix. The digest was fractionated by molecular sieve chromatography, monitoring for peptide absorbance, pyridinoline fluorescence, pyrroles by Ehrlich's reagent, and immunoassay for cross-linked N-telopeptides. Individual cross-linked peptides were resolved by ion-exchange and reverse-phase HPLC. Structures were established by NH2-terminal microsequencing, cross-link analysis, electrospray mass spectrometry, and immunoassay. Two, about equally occupied, sites of pyridinoline cross-linking were identified, N-telopeptide to helix and C-telopeptide to helix. Pyrroles were alternative cross-linking products at the same sites, but concentrated (85%) at the N-telopeptide end. Only one combination of chains was cross-linked by pyridinolines at the C-telopeptide to helix site, [alpha1(I)C]2alpha1(I)helix. Several peptide combinations arose from the N-telopeptide to helix site, but the main source of pyridinolines was from the locus, alpha1(I)Nalpha2(I)Nalpha1(I)helix. Pyridinolines linking two alpha1(N) telopeptides were a minor component. Pyrroles were concentrated at the locus, alpha1(I)Nalpha2(I)Nalpha2(I)helix. The cross-link ratio of hydroxylysylpyridinoline to lysylpyridinoline differed between N-telopeptide and C-telopeptide sites, and between the individual interchain combinations. Cross-linked N-telopeptides accounted for two-thirds of the total lysylpyridinoline in %%%bone%%%. N-telopeptide pyridinoline fluorescence was quenched on chromatography, so that reliance on peptide fluorescence alone can underestimate the level of N-telopeptide pyridinoline cross-linking.
Record Date Created: 19961216
Record Date Completed: 19961216

2/7/77 (Item 77 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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11956101 PMID: 8884650
Ability of commercial %%%demineralized%%% freeze-dried %%%bone%%% allograft to induce new %%%bone%%% formation.
Schwartz Z, Mellonig J T, Carnes D L, de la Fontaine J, Cochran D L, Dean D D, Boyan B D
Department of Periodontics, Hebrew University Faculty of Dental Medicine, Jerusalem, Israel.
Journal of periodontology (UNITED STATES) Sep 1996, 67 (9) p918-26, ISSN 0022-3492--Print Journal Code: 8000345
Publishing Model Print; Comment in J Periodontol. 1996 Sep;67(9) 946-8; Comment in PMID 8884653; Comment in J Periodontol. 1997 Aug;68(8):804-6; Comment in PMID 9287073
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE, Completed
%%%Demineralized%%% freeze-dried %%%bone%%% allograft (DFDBA) has been used extensively in periodontal therapy. The rationale for use of DFDBA includes the fact that proteins capable of inducing new %%%bone%%%; i.e., %%%bone%%% morphogenetic proteins, can be %%%isolated%%% from %%%bone%%% grafts. Commercial %%%bone%%% banks have provided DFDBA to the dental practitioner for many years; however, these organizations have not verified the osteoinductive capacity of their DFDBA preparations. The aim of this study was to determine the ability of commercial DFDBA preparations to induce new %%%bone%%% formation. DFDBA with particle sizes ranging from 200 to 500 microns was received from six %%%bone%%% banks using various %%%bone%%% production methods. Different lots of DFDBA from the same tissue bank were sometimes available. A total of 14 lots were examined. The surface area of %%%bone%%% particles in each sample was measured morphometrically and the pH of a solution containing the particles after suspension in distilled water determined. Samples from each DFDBA lot were implanted intramuscularly (10 mg) or subcutaneously (20 mg) into three different animals and tissue biopsies harvested after 4 weeks. One sample from each tissue bank was implanted and harvested after 8 weeks. At

harvest, each area where DFDBA had been implanted was excised and examined by light microscopy. The ability of DFDBA to produce new %%%bone%%% was evaluated and the amount of residual %%%bone%%% particles measured. The results show that %%%bone%%% particles from all tissue banks had a variety of shapes and sizes, both before implantation and after 1 or 2 months of implantation. The pH of particle suspensions also varied between batches, as well as between tissue banks. None of the DFDBA induced new %%%bone%%% formation when implanted subcutaneously. Intramuscular implants from three banks induced new %%%bone%%% formation after 1 and 2 months. DFDBA from two banks caused new %%%bone%%% formation only after 2 months. However, DFDBA from one bank did not induce new %%%bone%%% at all. Particle size before implantation correlated with particle size after implantation. However, particle size did not correlate with ability to induce %%%bone%%%. The results show that commercial DFDBA differs in both size and ability to induce new %%%bone%%% formation, but that the two are not related. The study also indicates that wide variation in commercial %%%bone%%% bank preparations of DFDBA exist and that ability to induce new %%%bone%%% formation also varies widely. Furthermore, the results suggest that methods or assays for evaluating the ability of DFDBA to induce new %%%bone%%% should be developed and standardized.
Record Date Created: 19970114
Record Date Completed: 19970114

2/7/78 (Item 78 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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11847709 PMID: 8725487
A study of the %%%bone%%% morphogenetic protein derived from bovine %%%demineralized%%% dentin matrix.
Mizutani H; Mera K; Ueda M; Iwata H
Department of Oral Surgery, Nagoya University School of Medicine, Japan.
Nagoya journal of medical science (JAPAN) Mar 1996, 59 (1-2) p37-47, ISSN 0027-7622--Print Journal Code: 0412011
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
We tried to extract and %%%purify%%% %%%bone%%% morphogenetic protein (BMP) from bovine %%%demineralized%%% dentin matrix (DDM). Crude dentin BMP (d-BMP) was extracted from DDM in 3 sequential steps. %%%Purification%%% of crude d-BMP was carried out by liquid chromatography. The molecular weight and the isoelectric point of the %%%purified%%% d-BMP were determined by sodium dodecylsulfate polyacrylamide gel electrophoresis (SDS-PAGE) and electrofocusing. All fractioned samples were bioassayed in the thigh muscle pouches of AKR strain mice to test their ability to induce new %%%bone%%% formation. A sequence of 3 extraction steps worked effectively to obtain crude d-BMP. The %%%purified%%% d-BMP was shown to be homogeneous on high performance liquid chromatography (HPLC) and SDS-PAGE. The molecular weight and the pI were 25 kDa and 6.5, respectively. The amino acid composition was different from that of known %%%bone%%%-derived BMP. The %%%purified%%% d-BMP induced new %%%bone%%% formation in the thigh muscle pouches. The molecular weight, pI and amino acid composition were different from those of %%%bone%%%-derived BMP.
Record Date Created: 19961205
Record Date Completed: 19961205

2/7/79 (Item 79 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

11847152 PMID: 8694892
%%%Bone%%% chondroadherin promotes attachment of osteoblastic cells to solid-state substrates and shows affinity to collagen.
Mizuno M; Fujisawa R; Kuboki Y
Department of Biochemistry, School of Dentistry Hokkaido University, Sapporo Japan 060.
Calcified tissue international (UNITED STATES) Sep 1996, 59 (3) p163-7, ISSN 0171-967X--Print Journal Code: 7905481
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Chondroadherin, which is reported to be synthesized by chondrocytes and to promote their attachment, was %%%purified%%% from bovine %%%bone%%%. It was a minor component of %%%bone%%% organic matrix, and was present in the 4 M guanidine extract of %%%demineralized%%% %%%bone%%%. Chondroadherin promoted attachment of osteoblastic cells to solid-state substrates, and bound to collagen. Binding of chondroadherin to collagen was significantly higher than that of osteonectin or decorin. These findings imply that chondroadherin may play a role in maintaining %%%bone%%% cells on the collagen matrices of %%%bone%%%.
Record Date Created: 19961015
Record Date Completed: 19961015

2/7/80 (Item 80 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

11805581 PMID: 8661043
Characterization of a novel gene product (mammalian tolloid-like) with high sequence similarity to mammalian tolloid/%%%bone%%% morphogenetic protein-1.
Takahara K; Brevard R; Hoffman G G; Suzuki N; Greenspan D S
Department of Pathology, University of Wisconsin Medical School, Madison, Wisconsin, 53706, USA.
Genomics (UNITED STATES) Jun 1 1996, 34 (2) p157-65, ISSN 0888-7543 --Print Journal Code: 8800135
Contract/Grant No.: GM46846; GM; United States NIGMS
Publishing Model Print
Document type: Comparative Study; Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
%%%Bone%%% morphogenetic protein-1 (BMP-1), a metalloprotease %%%isolated%%% from osteogenic extracts of %%%demineralized%%% %%%bone%%%, is capable of cleaving the C-propeptides of procollagen types I, II, and III. A single mammalian gene produces alternatively spliced RNA transcripts for BMP-1 and for a second longer protein, designated mammalian tolloid (mTld) due to a domain structure identical to that of the Drosophila dorsal-ventral patterning gene product tolloid (Tld). Here we report the use of a cDNA library, prepared from BMP-1/mTld-null mouse embryos, to %%%isolate%%% cDNA clones for a novel mammalian protein with a domain structure identical to that of mTld. The new protein, designated mammalian tolloid-like (mTll), has 76% identity with mTld for amino acid residues in all domains downstream of, and including, the protease domain. In contrast, the N-terminal activation domains of the two proteins show little similarity. In situ hybridizations show the distribution of mTll RNA to overlap extensively that previously shown for the BMP-1 and mTld RNA forms. However, mTll shows additional strong expression in structures of the developing, neonatal, and adult brain in which expression of BMP-1 and mTld has not been observed. The murine mTll gene (Tll) is mapped to central chromosome 8, which is a different chromosomal location than that of the BMP-1/mTld gene. Loci for some developmental abnormalities map to the same general chromosomal location as Tll.
Record Date Created: 19970211
Record Date Completed: 19970211

2/7/81 (Item 81 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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11799467 PMID: 8678436
Onlay %%%bone%%% augmentation with an osteoinductive implant.
Hetherington H E; Hollinger J O; Morris M R; Panje W R
Otolaryngology Service, Madigan Army Medical Center, Tacoma, Washington, USA.
Annals of otology, rhinology, and laryngology (UNITED STATES) Jul 1996, 105 (7) p568-73, ISSN 0003-4894--Print Journal Code: 0407300
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The repair of contour defects of craniofacial %%%bone%%% can be accomplished by several methods, including autogenous %%%bone%%% grafts, %%%demineralized%%% %%%bone%%%, and alloplastic materials. The objective of this study was to assess a biodegradable, xenogeneic, osteoinductive implant for craniofacial onlay %%%bone%%% augmentation. Twelve New Zealand White rabbits each had craniofacial onlays consisting of three experimental materials: 1) autograft; 2) allogeneic, %%%demineralized%%% block implant; and 3) partially %%%purified%%% osteoinductive protein (osteogenin) with allogeneic collagen and 50:50 poly (DL-lactide-co-glycolide). Implants with host %%%bone%%% were recovered after 20 weeks and assessed by histomorphometric methods. There was no evidence of adverse local reaction to the three treatments. No significant difference in %%%bone%%% replacement or %%%bone%%% density resulting from each of the implant types was demonstrated. In conclusion, the osteoinductive implants were well tolerated, and over the 20-week period they appeared to maintain their contour as onlays.
Record Date Created: 19960815
Record Date Completed: 19960815

2/7/82 (Item 82 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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11659745 PMID: 8747241
1995 Volvo Award in basic sciences. The use of an osteoinductive growth factor for lumbar spinal fusion. Part II: Study of dose, carrier, and species.
Boden S D; Schimandle J H; Hutton W C
Department of Orthopaedics, Emory University School of Medicine, Decatur, Georgia, USA.
Spine (UNITED STATES) Dec 15 1995, 20 (24) p2633-44, ISSN 0362-2436--Print Journal Code: 7610646
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
STUDY DESIGN: Efficacy of a bovine-derived osteoinductive growth factor was studied in a rabbit model and in a nonhuman primate model of posterolateral lumbar spinal fusion. OBJECTIVES: To determine the minimum effective dose of growth factor and the influence of different carrier material on the outcome of intertransverse process lumbar fusion. SUMMARY OF BACKGROUND DATA: %%%Bone%%% morphogenetic proteins and related growth factors are becoming increasingly available in %%%purified%%% extract or genetically engineered forms and are capable of inducing new %%%bone%%% formation in vivo. Osteoinductive growth factors to enhance lumbar spinal infusion have not been well studied in models of posterolateral intertransverse process fusion. Because of the diminished potential of %%%bone%%% regeneration in primates (including humans) compared with phylogenetically lower animals, extrapolations regarding dose and efficacy cannot be made directly from results obtained in experiments performed on phylogenetically lower animals. Experiments on non-human primates are a critical step before attempting to use these growth factors on humans. METHODS. One hundred fifteen adult New Zealand white rabbits and 10 adult rhesus macaques underwent single level posterolateral intertransverse process lumbar spinal arthrodesis to evaluate different doses and carrier materials for a bovine-derived osteoinductive %%%bone%%% protein extract. Rabbit fusion masses were evaluated 5 weeks after arthrodesis by manual palpation, radiography, biomechanical testing, and light microscopy. Monkey fusion masses were evaluated 12 weeks after arthrodesis by radiography and light microscopy. RESULTS: Successful posterolateral intertransverse process spinal fusions were achieved in the rabbit models using an osteoinductive growth factor with three different carriers (autogenous iliac %%%bone%%%, %%%demineralized%%% allogeneic %%%bone%%% matrix, and natural coral). There was a dose-dependent response to the osteoinductive growth factor in the rabbit model, indicating that a threshold must be overcome before %%%bone%%% formation is induced. The methodology for biologic enhancement of spinal fusion developed in the rabbit model transferred successfully to the rhesus monkey, where the use of the osteoinductive growth factor with a %%%demineralized%%% %%%bone%%% matrix carrier resulted in spinal fusion in 12 weeks. CONCLUSION: These experiments provide an essential building block in the understanding of the biology of spinal fusion and the use of osteoinductive growth factors to enhance a posterolateral intertransverse process spinal fusion. The achievement of posterolateral spinal fusion in the rhesus monkey using an osteoinductive growth factor is a significant step toward the biologic enhancement of spinal fusion in humans.
Record Date Created: 19961010
Record Date Completed: 19961010

2/7/83 (Item 83 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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11571470 PMID: 8529631
Immunohistochemical and biochemical analyses of 20,000-25,000-year-old fossil cartilage.
Franc S; Marzin E; Boutillon M M; Latont R; Lechene de la Porte P; Herbage D
Institut de Biologie et Chimie des Proteines, Centre National de la Recherche Scientifique Unite 412, Universite Cl. Bernard, Lyon, France.
European journal of biochemistry / FEBS (GERMANY) Nov 15 1995, 234 (1) p125-31, ISSN 0014-2956--Print Journal Code: 0107600
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
A cracked, irregular pellicle adhering to fossilized %%%bone%%% excavated from the Enlene cave (Ariege) and estimated to date from 20,000-25,000 years BP was examined to verify its cartilaginous nature, suggested previously on the basis of optical and electron microscopic investigations. Immunolabeling of the organic component revealed the presence of type II and IX collagens, associated with residual glycosaminoglycans, in the external zone of the pellicle. The cartilaginous nature of the pellicle was also demonstrated by biochemical identification of type II collagen as the major protein in the %%%demineralized%%% sample: the amino acid compositions of insoluble and soluble fractions were similar to that of pure type II collagen; cyanogen-bromide-generated peptides, prepared after reduction of the sample, had an electrophoretic pattern similar to that of cyanogen bromide peptides derived from type II collagen. The amino acid sequences of four tryptic peptides were identical to the corresponding human type II sequences. It was impossible to %%%isolate%%% intact alpha chains. All of the solubilized fractions were composed of a wide range of low-molecular-mass peptides demonstrating significant degradation of the collagen molecules that was not reflected in the well-preserved fibrillar structure observed at the ultrastructural level. The mineral fraction, characterized by X-ray diffraction, consisted of apatite (as in sub-chondral %%%bone%%%) associated with contaminating poorly crystallized components originating from the cave sediment. Energy dispersive spectrometry showed that the cartilaginous zone contained three times less phosphorus and calcium than the underlying %%%bone%%%. These results confirm the cartilaginous nature of the sample and the preservation of tissue-specific components, and suggest that the process of fossilization is closely related to a mechanism of phosphatization.
Record Date Created: 19960126

Record Date Completed: 19960126

2/7/84 (Item 84 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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11452994 PMID: 7652050
Cranioplasty in the growing canine skull using %%%demineralized%%% perforated %%%bone%%%.
Salyer K E; Bardach J; Squier C A; Gendler E; Kelly K M
Research Laboratory of the International Craniofacial Institute, Medical City Dallas Hospital, Texas, USA.
Plastic and reconstructive surgery (UNITED STATES) Sep 1995, 96 (4) p770-9, ISSN 0032-1052--Print Journal Code: 1306050
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
This study was designed to test the hypothesis that %%%demineralized%%% perforated %%%bone%%% matrix implant from canine skull and tibia induces new %%%bone%%% formation within the calvarial defect comparable with the %%%bone%%% induced by autogenous graft. We also were interested in determining whether %%%demineralized%%% perforated %%%bone%%% matrix implants from membranous %%%bone%%% have greater osseoinductive capacity in the calvarial area than %%%demineralized%%% perforated %%%bone%%% matrix implants from endochondral %%%bone%%%. Forty 12-week-old purebred beagles were used. Group I consisted of animals with unrepaired surgically created calvarial defects healed by secondary intention (n = 10). Group II consisted of animals with surgically created calvarial defects in which the %%%bone%%% was removed and replaced with an autograft (n = 10). Group III consisted of animals with surgically created calvarial defects in which the bony defect was closed with a %%%demineralized%%% perforated %%%bone%%% matrix implant obtained from beagle calvaria (n = 10). Group IV consisted of animals with surgically created calvarial defects in which the bony defect was closed with a %%%demineralized%%% perforated %%%bone%%% matrix implant obtained from beagle tibia (n = 10). The two control groups (I and II) allowed us to %%%isolate%%% the inductive capacity of %%%demineralized%%% perforated %%%bone%%% matrix implants and compare it with the healing of the %%%bone%%% defects left unrepaired or repaired with calvarial autografts. Animals were sacrificed after 8 and 12 weeks. In the present study we were able to verify that %%%demineralized%%% perforated %%%bone%%% matrix implants are well accepted in the calvarial defects with little tissue reaction remarkably little osteoclastic activity.(ABSTRACT TRUNCATED AT 250 WORDS)
Record Date Created: 19950927
Record Date Completed: 19950927

2/7/85 (Item 85 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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11421043 PMID: 7621348
EDTA-insoluble, calcium-binding proteoglycan in bovine %%%bone%%%.
Hashimoto Y; Lester G E, Caterson B; Yamauchi M Yamauchi M U NC, Chapel Hill
Department of Biochemistry, School of Dentistry, Aichi-gakuin University, Nagoya, Japan.
Calcified tissue international (UNITED STATES) May 1995, 56 (5) p398-402, ISSN 0171-967X--Print Journal Code: 7905481
Contract/Grant No.: AR32666; AR; United States NIAMS; DE10489; DE; United States NIDCR
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, Non-P.H.S.; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE, Completed
A calcium ion precipitable, trypsin-generated proteoglycan fragment has been %%%isolated%%% from the %%%demineralized%%% EDTA-insoluble matrices of %%%bone%%%. The %%%demineralized%%% matrix was completely digested with trypsin, increasing concentrations of CaCl2 were added to the supernatant, and the resulting precipitates were analyzed. The amount of precipitate gradually increased with higher concentrations of calcium and was reversibly solubilized by EDTA. After molecular sieve and anion exchange chromatography, a proteoglycan-containing peak was obtained. Immunochemical analysis showed that this peak contained chondroitin 4-sulfate and possibly keratan sulfate. Amino acid analysis showed that this proteoglycan contained high amounts of aspartic acid/asparagine (Asx), serine (Ser), glutamic acid/glutamine (Glx), proline (Pro), and glycine (Gly); however, it contained little leucine (Leu) which suggests that it is not a member of the leucine-rich small proteoglycan family. In addition, significant amounts of phosphoserine (P-Ser) and hydroxyproline (Hyp) were identified in hydrolysates of this fraction. A single band (M(r) 59 kDa) was obtained on SDS-PAGE that stained with Stains-all but not with Coomassie Brilliant Blue R-250. If %%%bone%%% powder was trypsinized prior to demineralization, this proteoglycan-containing fraction was not liberated. Collectively, these results indicate that a proteoglycan occurs in the %%%demineralized%%% matrix that is precipitated with CaCl2 and is closely associated with both mineral and collagen matrices. Such a molecule might facilitate the structural network for the induction of mineralization in %%%bone%%%.
Record Date Created: 19950830
Record Date Completed: 19950830

2/7/86 (Item 86 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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11306518 PMID: 7898050
Localization of matrix metalloproteinase 9 (92-kilodalton gelatinase/type IV collagenase = gelatinase B) in osteoclasts: implications for %%%bone%%% resorption.
Okada Y; Naka K; Kawamura K; Matsumoto T; Nakanishi I; Fujimoto N; Sato H ; Seiki M
Department of Pathology, School of Medicine, Kanazawa University, Japan.
Laboratory investigation; a journal of technical methods and pathology (UNITED STATES) Mar 1995, 72 (3) p311-22, ISSN 0023-6837--Print
Journal Code: 0376617
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
BACKGROUND: Matrix metalloproteinase 9 (MMP-9, 92-kD gelatinase/type IV collagenase = gelatinase B) is a member of the MMP gene family and implicated in tissue destruction in the various pathophysiologic conditions. Our previous study showed that MMP-9 %%%purified%%% from human fibrosarcoma cells can cleave the cross-link-containing NH(2)-terminal telopeptides of the alpha 2 chain of type I collagen and collagen types III, IV, and V as well as gelatins. EXPERIMENTAL DESIGN: To investigate the role of MMP-9 in %%%bone%%% resorption we have examined its localization in the human %%%bone%%% tissues by immunohistochemistry and in situ hybridization. The enzymic properties were also biochemically studied. RESULTS: Immunohistochemistry using monoclonal antibodies against MMP-1 (interstitial collagenase), MMP-2 (72-kD gelatinase/type IV collagenase = gelatinase A), MMP-3 (stromelysin-1), MMP-9, and tissue inhibitor of metalloproteinases-1 demonstrated that MMP-9 is localized exclusively in osteoclasts of the %%%bone%%% tissues from normal subjects and patients with rheumatoid arthritis or metastatic carcinoma whereas some osteoclasts are also labeled by anti-(MMP-1) antibody. Northern blot and in situ hybridizations of rheumatoid %%%bone%%% tissues using a RNA probe for MMP-9 exhibited strong signals for the mRNA within osteoclasts. MMP-9 depolymerized acid-insoluble polymers of type I collagen and digested collagen fibrils in the %%%demineralized%%% %%%bone%%%. The gelatinolytic activity of the proteinase was optimal at pH 7.5, but 50 to 80% of the full activity was retained at pH 5.5 to 6.0. It was also 90% active in the

presence of 100 nM Ca2. Degradation of acid-soluble and -insoluble type I collagens by MMP-9 was enhanced at higher concentrations of Ca2. The zymogen of MMP-9 was activated up to approximately 85% of full activity by incubation at pH 2.3. CONCLUSION/S: These results demonstrate that MMP-9 is produced by osteoclasts in the human %%%bone%%% tissues and suggest that it can degrade %%%bone%%% collagens in concert with MMP-1 and cysteine proteinases in the subosteoclastic microenvironment. This proteinase may play a role in the normal %%%bone%%% remodeling and pathologic %%%bone%%% resorption in the human diseases.
Record Date Created: 19950426
Record Date Completed: 19950426

2/7/87 (Item 87 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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11215717 PMID: 7877560
Use of osteoinductive implants in the treatment of %%%bone%%% defects.
Wolfe M W; Cook S D
Tulane University School of Medicine, New Orleans, Louisiana 70112.
Medical progress through technology (UNITED STATES) 1994, 20 (3-4) p155-68, ISSN 0047-6552--Print Journal Code: 0331260
Publishing Model Print
Document type: Journal Article; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Osteogenic proteins (OPs) are a family of %%%bone%%% matrix polypeptides %%%isolated%%% from a variety of mammalian species, including mouse, rat, bovine, monkey, and man. OPs initiate chondroblastic differentiation in pluripotent mesenchymal progenitor cells, followed by the synthesis of new %%%bone%%% by endochondral ossification. OPs have the ability to induce healing of osteoperiosteal defects in several animal models, supporting a possible therapeutic role in the reconstruction of %%%bone%%% defects. OPs are responsible for the osteoinductive capacity of %%%demineralized%%% %%%bone%%% matrix (DBM) implants, which may also prove to be clinically useful. Preliminary studies using %%%purified%%%, naturally occurring human osteogenic proteins in the clinical management of non-unions have reported promising results. A prospective, randomized clinical trial is currently underway, comparing recombinant human osteogenic protein-1 (rhOP-1) to autograft in the treatment of tibial non-unions. The use of osteogenic protein implants to augment or replace autogenous and allogenous %%%bone%%% grafts will reduce morbidity, and circumvent the risk of disease transmission associated with transplantation. (96 Refs.)
Record Date Created: 19950406
Record Date Completed: 19950406

2/7/88 (Item 88 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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11209126 PMID: 7532540
The effects of bisphosphonates on the resorption cycle of %%%isolated%%% osteoclasts.
Selander K; Lehenkari P; Vaananen H K
Department of Anatomy, University of Oulu, Finland.
Calcified tissue international (UNITED STATES) Nov 1994, 55 (5) p369-75, ISSN 0171-967X--Print Journal Code: 7905481
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Binding sites for wheat germ agglutinin (WGA)-lectin have been shown to become revealed in the %%%demineralized%%% resorption lacunae that osteoclasts excavate on %%%bone%%% substrate. Peroxidase-conjugated WGA-lectin, which binds to %%%bone%%% matrix glycoconjugates and proteoglycans, was used in pit formation assays to assess the activity of %%%isolated%%% osteoclasts cultured on either 3-amino-1,1-hydroxypropyliden e-bisphosphonate (APD)-or dichloromethylene bisphosphonate (Cl2MBP)-covered %%%bone%%% slices. Immunofluorescence and histochemical techniques were also used to study the effects of %%%bone%%%-bound bisphosphonates on %%%isolated%%% rat osteoclasts. Neither APD nor Cl2MBP interfered with the special organization of actin or vinculin in osteoclasts when the cells were initializing their resorption cycle. After 24 hours of culture, the number of resorbing osteoclasts increased strongly on control slices, but remained low on either APD- or Cl2MBP-treated slices. At this time, the actin and vinculin rings in osteoclasts also started to exhibit abnormal, more diffuse staining. Both bisphosphonates studied resulted in signs of cytotoxicity; the number of osteoclasts decreased on APD- or Cl2MBP-covered %%%bone%%% during the course of the study and those remaining attached exhibited severe cytoplasmic retractions. The total areas of resorption remained at significantly lower levels in both experimental groups studied, and this was due to decreases in both the number and sizes of individual resorption pits. The size of the most extensive lacunae detected on the Cl2MBP slices did not exceed 5 x 10(3) microns 2, whereas on the control slices, resorption pits bigger than 15 x 10(3) microns 2 were frequently discovered.
Record Date Created: 19950328
Record Date Completed: 19950328

2/7/89 (Item 89 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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11091545 PMID: 7942158
%%%Bone%%% formation by marrow osteogenic cells (MBA-15) is not accompanied by osteoclastogenesis and generation of hematopoietic supportive microenvironment.
Benayahu D; Gurevitch O; Zipori D; Wientroub S
Department of Cell Biology, Weizmann Institute of Science, Rehovot, Israel.
Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research (UNITED STATES) Jul 1994, 9 (7) p1107-14, ISSN 0884-0431--Print Journal Code: 8610640
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, Non-P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
This study was aimed at elucidating the relationship between osteogenic activity of marrow stromal cells and their ability to support hematopoiesis followed by the %%%bone%%%-remodeling process. We used the MBA-15 cell line, which expresses osteoblastic phenotype in vitro and forms %%%bone%%% in diffusion chamber. We have compared %%%bone%%% formation and hematopoietic responses elicited in vivo by these cells with the implantation of freshly %%%isolated%%% %%%bone%%% marrow cells (BMC) or %%%demineralized%%% tooth matrix (DTM). Both MBA-15 cells and BMC implanted under the kidney capsule, yielded intramembraneous %%%bone%%%, but DTM, implanted subcutaneously, elicited endochondral %%%bone%%%. MBA-15 formed primary %%%bone%%%, mimicking only the initial sequential stages of the ossification process. Neither histologic signs of %%%bone%%% resorption and remodeling nor tartrate-resistant acid phosphatase (TRAP)-positive cells and marrow formation were observed. %%%Bone%%% formation was monitored biochemically. Functions for hematopoietic stem and committed cell content were measured by GM-CFU and BFU-E assays that confirmed the morphologic observations. In both BMC and DTM implantation, %%%bone%%% formation was followed by hematopoietic activity, osteoclastogenesis, and remodeling. We conclude that MBA-15 osteoprogenitor cells, despite their extensive %%%bone%%% formation ability, are unable to form a microenvironment supportive for hematopoiesis and osteoclastogenesis or to initiate %%%bone%%% remodeling.
Record Date Created: 19941101
Record Date Completed: 19941101

2/7/90 (Item 90 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

11080779 PMID: 7931779
Effect of sterilization on %%%bone%%% morphogenetic protein.
Ijiri S; Yamamuro T; Nakamura T; Kotani S; Notoya K
Department of Orthopaedic Surgery, Faculty of Medicine, Kyoto University, Japan.
Journal of orthopaedic research - official publication of the Orthopaedic Research Society (UNITED STATES) Sep 1994, 12 (5) p628-36, ISSN 0736-0266--Print Journal Code: 8404726
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
%%%Demineralized%%% %%%bone%%% matrix and %%%bone%%% morphogenetic
protein have been used clinically to accelerate %%%bone%%% regeneration. However, the best method of sterilization has been the subject of controversy. Some investigators have used ethylene oxide, but others have reported that doses adequate for sterilization destroyed the osteoinductivity of %%%demineralized%%% %%%bone%%% matrix and that gamma irradiation was less harmful in this respect. We used partially %%%purified%%% %%%bone%%% morphogenetic protein and type-I collagen to investigate the effects of sterilization by ethylene oxide and gamma irradiation on the activity of %%%bone%%% morphogenetic protein. Osteoinductivity was reduced considerably after sterilization by gamma irradiation at 2.5 Mrad and by ethylene oxide at 37 degrees C for 4 hours and at 55 degrees C for 1 hour; however, the reduction induced by ethylene oxide at 29 degrees C for 5 hours was about half of the control values. This study showed that ethylene oxide at 29 degrees C for 5 hours can be used clinically for sterilization of %%%bone%%% morphogenetic protein. We also investigated the effect of gamma irradiation on %%%bone%%% morphogenetic protein and the collagen carrier separately and found that collagen was far more labile than %%%bone%%% morphogenetic protein.
Record Date Created: 19941115
Record Date Completed: 19941115

2/7/91 (Item 91 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10932870 PMID: 8175993
Application of %%%purified%%% %%%bone%%% morphogenetic protein (BMP) in cranio-maxillo-facial surgery. BMP in compromised surgical reconstructions using titanium implants.
Sailer H F; Kolb E
Department of Cranio-Maxillo-Facial Surgery, University Hospital Zurich, Switzerland.
Journal of cranio-maxillo-facial surgery - official publication of the European Association for Cranio-Maxillo-Facial Surgery (SCOTLAND) Feb 1994, 22 (1) p2-11, ISSN 1010-5182--Print Journal Code: 8704309
Publishing Model Print
Document type: Case Reports; Journal Article; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
After a review of the clinically relevant literature on early modified whole %%%bone%%% products (%%%demineralized%%% %%%bone%%%; AAA %%%bone%%%
(Urist et al., 1975))--predecessors of %%%purified%%% %%%bone%%% morphogenetic protein (BMP)--and a summary of the only published clinical experience with %%%purified%%% human BMP (in orthopedic surgery; from the group of Urist; Johnson et al., 1988-1992), an introductory overview of our experience with our own preparations of BMP from bovine %%%bone%%% in 271 procedures on the face and cranium in 145 patients is presented. In this first article of a series of three, major preprosthetic reconstructions using iliac %%%bone%%% grafts and titanium screw implants are described. All patients are examples of compromised %%%bone%%% and/or soft tissue conditions and cannot be considered routine indications for the operations performed. The most endangered implants became osseointegrated after 6 to 8 1/2 months as judged from clinical examination and CT imaging. These results demonstrate the efficacy of %%%purified%%% , concentrated BMP preparations, able unequivocally to induce %%%bone%%% even in areas with seemingly lost implants. (28 Refs.)
Record Date Created: 19940609
Record Date Completed: 19940609

2/7/92 (Item 92 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10866851 PMID: 8119030
In vitro proteoglycan synthesis in response to extracts of %%%demineralized%%% %%%bone%%%.
Nathanson M A
Department of Anatomy, Cell Biology, and Injury Sciences, New Jersey Medical School, Newark 07103.
Clinical orthopaedics and related research (UNITED STATES) Feb 1994, (299) p263-81, ISSN 0009-921X--Print Journal Code: 0075674
Publishing Model Print
Document type: Comparative Study; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Two extracts of bovine %%%bone%%%, %%%bone%%% morphogenetic protein (BMP) supplied by the UCLA %%%Bone%%% Research Laboratory, and osteogenic factor extract (OFE) supplied by the industrial group Celtrix Pharmaceuticals, were tested for the ability to transform embryonic skeletal muscle into cartilage. Skeletal muscle was placed into organ cultures on substrata of Type I collagen and fed with concentrations of the extracts that their originators reported to be effective; however, only BMP was capable of eliciting the morphologic differentiation of cartilage. In contrast, both extracts supported patterns of glycosaminoglycan synthesis that mimicked the biochemical differentiation of cartilage-type extracellular matrix. %%%Bone%%% morphogenetic protein differed from OFE in its ability to elicit high levels of hyaluronic acid synthesis, although BMP and OFE upregulated synthesis of hyaluronic acid that was of sufficient chain length to support proteoglycan aggregate formation. Proteoglycan extracts of the cell layer and medium demonstrated that most of the proteoglycan synthesized in response to BMP was an aggrecan-like material, which was lost to the medium. That which synthesized in response to OFE was a proteoglycan with short glycosaminoglycan chains that had only a limited ability to aggregate. These results demonstrate that BMP is effective in promoting chondrogenesis by virtue of its ability to promote the synthesis of hyaluronic acid, and aggrecan, but suggests that other accessory matrix components must also be synthesized to anchor aggrecan in the cell layer. The ability to stimulate the synthesis of these other components may be lost on %%%purification%%% of BMP. Consequently, BMP may initiate several activities that collectively upregulate chondrogenesis and the production of cartilage extracellular matrix.
Record Date Created: 19940407
Record Date Completed: 19940407

2/7/93 (Item 93 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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10829418 PMID: 8158287
Characteristics of a 28-kDa collagenous protein extracted with guanidine from EDTA-%%%demineralized%%% rabbit alveolar %%%bone%%%.
Maeno M; Oikawa E; Taguchi M; Suzuki N; Shiraishi Y; Hayashi A; Yahagi N; Katayama I; Otsuka K
Department of Biochemistry, Nihon University School of Dentistry, Tokyo, Japan.

Journal of Nihon University School of Dentistry (JAPAN) Dec 1993, 35 (4) p258-66, ISSN 0029-0432--Print Journal Code: 7509209
Publishing Model:Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed

%%%Bone%%% proteins in alveolar %%%bone%%% of mandibles from young adult rabbits (3-month-old) were extracted with 4.0 M guanidine hydrochloride (GuHCl), followed by 0.5 M ethylenediaminetetraacetate, and again with 4.0 M GuHCl (G2-ext). The proteins in the G2-ext were fractionated on a gel-filtration column, followed by an anion-exchange column in the presence of 7.0 M urea. A 28-kDa protein was %%%isolated%%% from the G2-ext. The %%%purified%%% 28-kDa protein showed intense staining with silver on SDS-PAGE slab-gel under reducing conditions. This protein was digested with bacterial collagenase, and a 19-kDa fragment appeared on the gel. However, the protein was not susceptible to reduction with cyanogen bromide. The protein did not bind to hydroxyapatite crystals in the presence of 7.0 M urea, and also did not bind to some lectins. On SDS-PAGE under non-reducing conditions, the protein migrated as two bands; a new band appeared at approximately the 85-kDa region in addition to the original 28-kDa band. The amino acid compositions of the protein were similar to those of the alpha 1-pN-propeptide of type I procollagen obtained from other tissues.
Record Date Created: 19940518
Record Date Completed: 19940518

2/7/94 (Item 94 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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10828564 PMID: 8154838

Heterotopic osteoinduction in a rat membrane-%%%isolated%%% latissimus dorsi island flap. A pilot study.
Viljanen V V; Lindholm T S
Department of Clinical Medicine, University of Tampere, Finland.
Annales chirurgiae et gynaecologiae. Supplementum (FINLAND) 1993, 207 p55-62, ISSN 0355-9874--Print Journal Code: 7702959
Publishing Model:Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed

Applying our knowledge of heterotopic osteoinduction by %%%bone%%% morphogenetic protein (BMP) and %%%demineralized%%% %%%bone%%% matrix (DBM), we sought to induce ossification of membrane-%%%isolated%%% latissimus dorsi flaps in the rat. Our aim was to produce an animal model for a versatile "custom-made" %%%bone%%% island flap which could be used as a substitute for %%%bone%%% . Ten latissimus dorsi island flaps in nine Wistar rats, 5-6 weeks of age, were prepared using microsurgical techniques in aseptic conditions. The flaps were %%%isolated%%% from other tissues with silicone, Gortex or OpSite membranes. We applied 3-9 mg partially %%%purified%%% bovine BMP or 0.1 -0.25mg BMP bound covalently to type IV collagen with 15mg DBM inside the flaps. We have five animals with eight implants of BMP and DBM in latissimus muscle pouches as rat bioassay controls. The results were evaluated after a period of three weeks using soft X-ray radiography and histology with hematoxylin-eosin-azure II and Alcian blue stains. Positive radiological results were observed in 10/10 flaps (100%), in controls in 7/8 (87.5%). Positive histological results comprised 8/10 (80%) and in controls 7/8 (87.5%). Two flaps (20%) showed partial necrosis. These did not lower the percentage of either positive histological or radiological findings, but exemplified some of the problems which are faced in this kind of tissue engineering.
Record Date Created: 19940512
Record Date Completed: 19940512

2/7/95 (Item 95 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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10828560 PMID: 8154834

High yield of osteoinductivity can be derived from %%%demineralized%%% %%%bone%%% matrix using collagenase digestion.
Jortikka L; Marttinen A; Lindholm T S
Department of Clinical Medicine, University of Tampere, Finland.
Annales chirurgiae et gynaecologiae. Supplementum (FINLAND) 1993, 207 p31-5, ISSN 0355-9874--Print Journal Code: 7702959
Publishing Model:Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed

A %%%bone%%% morphogenetic protein %%%purification%%% method for minor quantities of %%%bone%%% material was developed based on collagenase splitting of %%%bone%%% connective tissue. Our aim was to remove and characterize the osteoinductive protein preparation in native form without using strongly dissociative agents. We started from 80 g of HCl-%%%demineralized%%% reindeer %%%bone%%% material which was treated with type I collagen splitting collagenase. The solution was dialyzed against 10 mM glycine-HCl buffer, pH 5.2. The formed precipitate was found to be osteoinductive. After fractionation of the material using HPLC gel filtration it was observed that the high-molecular-weight component of the precipitate was biologically active. Isoelectric focusing revealed that the component consisted of at least eight different protein molecules. Lower-molecular-weight components induced no %%%bone%%% formation. These preliminary findings suggest that in native form at least one part of BMP is in a complex form and other extracellular matrix components bound to the osteoinductive protein complex are significant for BMP action and may act synergistically or as carriers for the BMP.
Record Date Created: 19940512
Record Date Completed: 19940512

2/7/96 (Item 96 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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10828557 PMID: 8154831

%%%Purification%%% of monocomponent bovine %%%bone%%% morphogenetic protein in a water-soluble form.
Jortikka L; Marttinen A; Lindholm T S
Department of Clinical Medicine, University of Tampere, Finland.
Annales chirurgiae et gynaecologiae. Supplementum (FINLAND) 1993, 207 p25-30, ISSN 0355-9874--Print Journal Code: 7702959
Publishing Model:Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed

Noncollagenous protein material was extracted from HCl-%%%demineralized%%% bovine %%%bone%%% particles in 4 M guanidinium hydrochloride. Water- and citrate buffer-insoluble material was collected, solubilized in 6 M urea and fractionated by preparative isoelectric focusing using a running voltage of 5000 V. The material removed from the area between pH 4.7 and 5.7 of the isoelectric focusing gel was osteoinductive (identified by its capacity to induce %%%bone%%% development). This was solubilized in 6 M urea and dialyzed against 0.2 M Tris buffer. The Tris buffer-soluble material was fractionated by HPLC gel filtration. The water- and citrate buffer-insoluble material contained mainly high-molecular-weight protein complexes which were osteoinductive, and < 5% of the material was osteoinductive monocomponent %%%bone%%% morphogenetic protein. The Tris buffer-soluble material contained only two polypeptides: an osteoinductive peptide of molecular weight 18,500 and a non-osteoinductive peptide of molecular weight 8,000. The very high voltage used during the isoelectric focusing caused a slow break-down of the urea-soluted protein complexes, which significantly increased the yield of monocomponent %%%bone%%% morphogenetic protein. By the present method it is possible to prepare Tris buffer solution containing up to 2 mg/ml of pure monocomponent %%%bone%%% morphogenetic protein.

Record Date Created: 19940512
Record Date Completed: 19940512

2/7/97 (Item 97 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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10806717 PMID: 8106854
Demineralization of %%%bone%%% by ammonium chloride for the pyroantimonate method.
Kawamata S
Department of Anatomy, Toyama Medical and Pharmaceutical University, Japan.
Journal of electron microscopy (JAPAN) Oct 1993, 42 (5) p338-41, ISSN 0022-0744--Print Journal Code: 7611157
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Rat bones were fixed by the pyroantimonate method and %%%demineralized%%% by treatment with ammonium chloride (NH4Cl). Bones from very young rats (neonatal and 2-week-old rats) that had been treated with NH4Cl were easy to cut into ultrathin sections. However, bones of 8-week-old rats needed to be %%%demineralized%%% for a longer time and were not very easy to cut. The extent of demineralization was measured by scintillation counting. After demineralization, precipitates of calcium pyroantimonate (Ca-pyroantimonate) were well retained and the fine structure of the tissue was well preserved. In addition, the distribution of Ca-pyroantimonate in the %%%demineralized%%% %%%bone%%% was similar to that in undecalcified specimens. This demineralization method is used in combination with the pyroantimonate method.
Record Date Created: 19940318
Record Date Completed: 19940318

2/7/98 (Item 98 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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10775531 PMID: 8275355
Temporal changes during %%%bone%%% regeneration in the calvarium induced by osteogenin.
Marden L J; Quigley N C; Reddi A H; Hollinger J O
US Army Institute of Dental Research, Walter Reed Army Medical Center, Washington, District of Columbia 20307-5300.
Calcified tissue international (UNITED STATES) Oct 1993, 53 (4) p282-8, ISSN 0171-967X--Print Journal Code: 7905481
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Repair of rat craniotomy defects, 8 mm in diameter, was compared with that of defects treated with either rat insoluble collagenous %%%bone%%% matrix (ICBM) or partially %%%purified%%% bovine osteogenin, a %%%bone%%% -inductive protein, reconstituted with ICBM (OG/ICBM). Repair of all defects was similar histologically throughout the first 3 days, characterized by acute, then chronic inflammation and granulation tissue formation. In defects treated with OG/ICBM, cartilage and osteoblasts were present at day 5. By day 9, cartilage and osteoid production were active. New %%%bone%%% showed hematopoietic tissue by day 11; a complete %%%bone%%% bridge was established by day 21. By day 42, fatty marrow was present. Defects treated with ICBM alone showed islands of cartilage and %%%bone%%% embedded in connective tissue at day 9, which reached peak maturity by day 14. In these and in untreated defects, significant osteoblastic and osteoclastic activity, located primarily at the margins of the defects, subsided by day 28. Untreated defects gradually filled in with fibrous connective tissue which matured throughout 156 days. Radiopacity, quantified by computerized image analysis, increased significantly between days 9 and 11 in OG/ICBM-treated defects, and remained greater ($P < 0.05$) than that of the ICBM-treated defects. There was a more gradual increase in radiopacity in ICBM-treated defects. The sequence of morphologic events during calvarial %%%bone%%% regeneration was very similar to that described previously for heterotopic %%%bone%%% formation induced by %%%demineralized%%% %%%bone%%% matrix.
Record Date Created: 19940207
Record Date Completed: 19940207

2/7/99 (Item 99 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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10740660 PMID: 8242946
Partially %%%purified%%% reindeer (Rangifer tarandus) %%%bone%%% morphogenetic protein has a high %%%bone%%%-forming activity compared with some other antiosactyls.
Jortikka L; Marttinen A; Lindholm T S
Department of Clinical Medicine, University of Tampere, Finland.
Clinical orthopaedics and related research (UNITED STATES) Dec 1993, (297) p33-7, ISSN 0009-921X--Print Journal Code: 0075674
Publishing Model Print
Document type: Comparative Study; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Noncollagenous proteins, including %%%bone%%% morphogenetic protein (BMP), were extracted in 4 mol/l guanidinium hydrochloride (GuHCl) from the pulverized and HCl-%%%demineralized%%% matrix of reindeer, bovine, sheep and porcine %%%bone%%%. To remove water-soluble material, the GuHCl solution was dialyzed against water and water-insoluble material and redissolved in 4 mol/l GuHCl. Gelatin peptides were removed by extraction in 0.25 mol/l citrate buffer (pH 3.1). The yield consisted mostly of large complexes and protein molecules of molecular weight less than 35,000 daltons. Isoelectric focusing of the material showed three to four different protein molecules: three acidic and one neutral. %%%Bone%%% -forming activity was investigated by implanting 0.6-15.0 mg of partially %%%purified%%% protein preparation into the thigh muscles of BALB mice. Radiologically detectable formation of new %%%bone%%% required 0.6 mg of reindeer BMP, 2.5 mg of bovine BMP, 5.1 mg of sheep BMP, and 8.0 mg of porcine BMP. A rough estimate of the area of the deposits showed that reindeer BMP had the highest %%%bone%%% formation activity, and porcine had the lowest. The formation of new %%%bone%%% was confirmed histologically. It is suggested that the differences in osteogenic activity are due to quantitative differences in BMP constituents or in the degree of complex formation in the protein preparations. Also immune and other defense mechanisms may generate differences in osteogenic response.
Record Date Created: 19940106
Record Date Completed: 19940106

2/7/100 (Item 100 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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10678561 PMID: 8378575
Skeletal growth after oral administration of %%%demineralized%%% %%%bone%%% matrix.
Martinez J A; Elorriaga M; Marquinez M; Larralde J
Departamento de Fisiologia y Nutricion, Universidad de Navarra, Pamplona, Spain.
Revista espanola de fisiologia (SPAIN) Mar 1993, 49 (1) p37-41, ISSN 0034-9402--Print Journal Code: 0404475
Publishing Model Print
Document type: Comparative Study; Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH

Main Citation Owner: NLM
Record type: MEDLINE, Completed
Oral administration of %%%bone%%% extracts obtained from bovine %%%demineralized%%% %%%bone%%% matrix to rats has a direct effect on %%%bone%%% metabolism, affecting %%%bone%%% proportions and some markers of %%%bone%%% formation such as %%%bone%%% malate dehydrogenase, serum alkaline phosphatase and serum osteocalcin. Furthermore collagen deposition, %%%bone%%% protein synthesis and nucleic acids content were significantly increased by the treatment.
Record Date Created: 19931015
Record Date Completed: 19931015

2/7/101 (Item 101 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10671729 PMID: 8373392
Changes in the expression of insulin-like growth factor II/mannose-6-phosphate receptor during endochondral %%%bone%%% development.
Yu Y M; Sklar M M; Nissley S P; Reddi A H
Bone Cell Biology Section, National Institute of Dental Research, National Institutes of Health, Bethesda, Maryland 20892.
Biochemical and biophysical research communications (UNITED STATES) Sep 15 1993, 195 (2) p516-24, ISSN 0006-291X--Print Journal Code: 0372516
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Endochondral %%%bone%%% development can be induced by subcutaneous implantation of %%%demineralized%%% %%%bone%%% matrix (DBM) in rats. We used this in vivo model to study the relationship between endochondral %%%bone%%% formation and expression of IGF-II/M-6-P receptor, a multifunctional protein which binds not only IGF-II, but also lysosomal enzyme bearing mannose-6-phosphate motif. We found that IGF-II/M-6-P receptor was present in implants from day 1 to day 21; the highest levels were expressed on day 11 during %%%bone%%% differentiation. IGF-II/M-6-P receptor mRNA content was highest on day 9. We conclude from these data that IGF-II/M-6-P receptor expression is developmentally regulated during endochondral %%%bone%%% formation. This regulation occurs in part at the level of IGF-II/M-6-P receptor mRNA. The relatively high level of IGF-II/M-6-P receptor during ossification suggests that this receptor might play a role in %%%bone%%% formation and remodeling.
Record Date Created: 19931012
Record Date Completed: 19931012

2/7/102 (Item 102 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10660270 PMID: 8364488
%%%Purification%%% of water-soluble %%%bone%%%-inductive protein from bovine %%%demineralized%%% %%%bone%%% matrix.
Yoshimura Y; Hirano A; Nishida M; Kawada J; Horisaka Y; Okamoto Y; Matsumoto N; Yamashita K; Takagi T
Department of Biochemistry, Faculty of Pharmaceutical Sciences, University of Tokushima, Japan.
Biological & pharmaceutical bulletin (JAPAN) May 1993, 16 (5) p444-7 , ISSN 0918-6158--Print Journal Code: 9311984
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The water-soluble fraction containing %%%bone%%%-inductive activity was %%%purified%%% from guanidine-hydrochloride extracts of bovine %%%demineralized%%% %%%bone%%%. The %%%purification%%% steps include ultrafiltration, dialysis, affinity chromatography on heparin-Sepharose and gel chromatography on Sephacryl S-200. Combination of these steps was proven to be an effective and rapid method for the %%%purification%%% of this protein. Subcutaneous implantation of the water-soluble protein with type I collagen was carried out in the thorax of rats. When alkaline phosphatase activity and calcium content in implants were used as indices for %%%purification%%%, the water-soluble %%%bone%%%-inductive protein was %%%purified%%% > 600-fold according to the enzyme activity and 64-fold according to the calcium content. A morphological examination revealed that many chondrocyte and osteoblast cells were seen in the location of the implanted material. Sodium dodecyl sulfate/gel electrophoresis of the protein produced in this way under non-reducing conditions revealed four protein bands of 18, 16, 14 and 11 kDa. None of the separated bands had any biological activity. This result suggests that the water-soluble %%%bone%%% -inductive activity depends on an associated form of various proteins in the range of 18 to 11 kDa.
Record Date Created: 19931006
Record Date Completed: 19931006

2/7/103 (Item 103 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10631809 PMID: 8342237
The effect of sterilization on transforming growth factor beta %%%isolated%%% from %%%demineralized%%% human %%%bone%%%.
Puolakkainen P A; Ranchalis J E; Strong D M; Twardzik D R
Bristol-Myers Squibb Pharmaceutical Research Institute, Seattle, Washington.
Transfusion (UNITED STATES) Aug 1993, 33 (8) p679-85, ISSN 0041-1132--Print Journal Code: 0417360
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Growth factors have been identified as the primary cause of osteoinduction in %%%bone%%% healing. Transforming growth factor beta (TGF-beta) has been shown to promote %%%bone%%% formation and is present in %%%bone%%% in high quantities. The aims of the present study were to %%%isolate%%% TGF-beta from human %%%bone%%% , demonstrate its biologic activity, and analyze the effects of conventional sterilization techniques on activity. %%%Bone%%%, obtained from femoral heads of five patients (mean age, 70 years) was ground, %%%demineralized%%%, and freeze-dried, and samples from each patient were divided into three groups: no treatment, sterilization with 1.60 to 1.94 Mrad of 60Co irradiation, and sterilization with ethylene oxide (ETO). Carrier-free recombinant TGF-beta control was also treated and was totally inactivated by ETO but not by irradiation ($p < 0.01$). TGF-beta activity in %%%demineralized%%% %%%bone%%% was not significantly diminished ($p > 0.1$) by either sterilization procedure, and substantial amounts of active TGF-beta were recovered in all %%%bone%%% samples: 1.04 0.77 ng per mg of protein in irradiated samples, 0.67 0.26 ng per mg in ETO-treated samples, and 1.04 0.33 in untreated samples, respectively (mean SD). Although a recent report demonstrated that the osteoinductive activity of %%%bone%%% morphogenetic protein in %%%bone%%% powder is diminished considerably by ETO and by 2.5 Mrad of irradiation sterilization of %%%bone%%% powder, these data demonstrate that TGF-beta activity, with its osteoinductive properties, was not destroyed in more coarsely ground, %%%demineralized%%% %%%bone%%% by ETO or by lower doses of irradiation. These findings support the use of human %%%bone%%% allografts in clinical instances involving impaired %%%bone%%% formation.
Record Date Created: 19930831
Record Date Completed: 19930831

2/7/104 (Item 104 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10613892 PMID: 8101026

%%%isolation%%% and complete amino acid sequence of osteocalcin from canine %%%bone%%%.
Colombo G; Fanti P; Yao C; Malluche H H
Department of Biochemistry, Albert B. Chandler Medical Center, University of Kentucky, Lexington.
Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research (UNITED STATES) Jun 1993, 8 (6) p733-43, ISSN 0884-0431--Print Journal Code: 8610640
Contract/Grant No.: NIAMS AR-35837; AR; United States NIAMS
Publishing Model Print
Document type: Comparative Study; Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, Non-P.H.S.; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Osteocalcin was %%%purified%%% in high yield and to homogeneity from the diaphysis of dog femora by the following steps: (1) acid demineralization of %%%bone%%% powder, (2) solid-phase extraction of acid-soluble proteins on Sep-Pak C18 cartridges, (3) gel filtration on Sephadex G-50, and (4) fast protein liquid chromatography on an Accell-QMA anion-exchange column. Starting from 30 g washed %%%bone%%% powder, approximately 7-10 mg pure protein was obtained in 2 days. The key step is the initial solid-phase extraction of osteocalcin from a large volume of a %%%demineralized%%% %%%bone%%% solution. The primary structure was established by automated sequence analyses of two tryptic peptides, of two endoproteinase Glu-C carboxy-terminal peptides, and of the first 30 amino acid residues of the intact protein. Dog osteocalcin contains 49 amino acids, has a molecular mass of 5654 daltons, contains no Thr, Met, Hyp, or Trp, has a disulfide bond between Cys 23 and 29, and is fully gamma-carboxylated at residues 17, 21, and 24. Dog osteocalcin does not contain a pair of basic amino acids found at positions 43-44 in most other osteocalcins from mammals and birds. A computer search for homology indicated 88, 90, 84, 86, 66, and 57% sequence identity of dog osteocalcin with human, bovine, cat, monkey, chicken, and swordfish osteocalcin, respectively, and weaker homologies with the gamma-carboxylated domains of blood-clotting proteins and the Pro-rich N-terminal extensions of mycosin light-chain A1 and beta-crystalline B1. The possible relevance of these homologies to the structure and potential functions of osteocalcin is discussed.
Record Date Created: 19930809
Record Date Completed: 19930809

2/7/105 (Item 105 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10549217 PMID: 8482901
%%%[Purification%%% of %%%bone%%% morphogenetic protein and investigation of its effects on osteoblastic cell line UMR106]
Sakurai N
Department of Oral and Maxillofacial Surgery II, Faculty of Dentistry, Tokyo Medical and Dental University.
Kokubyo Gakkai zasshi. The Journal of the Stomatological Society, Japan (JAPAN) Mar 1993, 60 (1) p169-82, ISSN 0300-9149--Print
Journal Code: 0413677
Publishing Model Print
Document type: English Abstract; Journal Article
Languages: JAPANESE
Main Citation Owner: NLM
Record type: MEDLINE; Completed
It is well known that the %%%bone%%% matrix contains proteins which can induce ectopic endochondral %%%bone%%% formation in vivo. One class of these proteins is the %%%bone%%% morphogenetic protein (BMP). In order to investigate the physiological function of the BMP, its %%%purification%%% was attempted from an extract of %%%demineralized%%% %%%bone%%% matrix and its actions on the osteoblastic cell line were investigated. To %%%isolate%%% the BMP, a %%%demineralized%%% %%%bone%%% matrix was extracted with 4M guanidine-HCl. A water-insoluble fraction (G-WI) was separated from the %%%demineralized%%% %%%bone%%% extract by dialysis against distilled water and centrifugation. The BMP was %%%purified%%% from G-WI by gel filtration on Sephacryl S-200 HR, cation exchange with Mono-S, heparin affinity column and finally by C1/8 reverse phase chromatography. Peptide sequence analysis revealed that the %%%purified%%% BMP fraction contained "BMP-3" reported by Wozney et al. (1988). In order to investigate its function, the BMP was applied to the rat osteogenic sarcoma cell line UMR108. The BMP inhibited the growth of the UMR108 cells and enhanced the alkaline phosphatase activity in a dose-responsive manner.
Record Date Created: 19930602
Record Date Completed: 19930602

2/7/106 (Item 106 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10455762 PMID: 8416537
Reconstruction of the %%%bone%%%--%%%bone%%% marrow organ by osteogenin, a %%%bone%%% morphogenetic protein, and %%%demineralized%%% %%%bone%%% matrix in calvarial defects of adult primates.
Ripamonti U; Ma S S; Cunninghamn N S; Yeates L; Reddi A H
Medical Research Council/University of the Witwatersrand, Johannesburg, South Africa.
Plastic and reconstructive surgery (UNITED STATES) Jan 1993, 91 (1) p27-36, ISSN 0032-1052--Print Journal Code: 1306050
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Information concerning the efficacy of osteogenin, a %%%bone%%% morphogenetic protein, and %%%demineralized%%% %%%bone%%% matrix in orthotopic sites in nonhuman primates is a prerequisite for potential clinical application in humans. After exposure of the calvaria, 84 cranial defects, 25 mm in diameter, were prepared in 26 adult male baboons (Papio ursinus). Defects were implanted with insoluble collagenous %%%bone%%% matrix (ICBM, the inactive collagenous residue after dissociative extraction of %%%bone%%% matrix with 4 M guanidine hydrochloride) reconstituted with osteogenin fractions %%%isolated%%% from baboon %%%bone%%% matrix by chromatography on heparin-Sepharose and hydroxyapatite-Ultrogel (Og Hep-HA) or osteogenin further %%%purified%%% using Sephacryl S-200 gel filtration chromatography (Og S-200). Baboon osteogenin with the highest biologic activity in a rodent bioassay, as determined by alkaline phosphatase activity, calcium content, and histologic analysis, was used for orthotopic implantation in baboons. Additional defects were implanted with baboon %%%demineralized%%% %%%bone%%% matrix (DBM) or ICBM without osteogenin as control. Defects also were grafted with corticocancellous %%%bone%%% harvested from the iliac crest or left ungrafted to monitor the spontaneous regeneration potential of the adult baboon calvaria. Undecalcified %%%bone%%% sections at 7 microns were prepared from the harvested specimens 30 and 90 days after surgery. Histomorphometry demonstrated that Og S-200 induced copious amounts of %%%bone%%% and osteoid as early as day 30 ($P < 0.01$ versus ICBM, autogenous grafts and untreated defects). At day 90, in implants of Og S-200, Og Hep-HA, and DBM, %%%bone%%% and marrow formation was extensive, culminating in complete regeneration of the craniotomies. In implants of DBM, %%%bone%%% formed with an intervening phase of cartilage development. This provides the phenotypic evidence of endochondral %%%bone%%% differentiation by induction in defects of membranous calvarial %%%bone%%% in adult primates. These results establish the potential therapeutic application of osteogenin and %%%demineralized%%% %%%bone%%% matrix for the architectural reconstruction of the %%%bone%%%-%%%bone%%% marrow organ in humans.
Record Date Created: 19930121
Record Date Completed: 19930121

2/7/107 (Item 107 from file: 155)

DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10438894 PMID: 1302892
Potential induction of osteogenesis by systemic administration of bovine %%%bone%%% proteins.
Marquinez M; Elorriaga M; Martinez J A; Larralde J
Departamento de Fisiologia y Nutricion, Universidad de Navarra, Pamplona, Spain.
Revista espanola de fisiologia (SPAIN) Dec 1992, 48 (4) p231-7, ISSN 0034-9402--Print Journal Code: 0404475
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
This study shows, apparently for the first time, that the administration of %%%bone%%% derived proteins (putative %%%bone%%% growth factors) obtained from bovine %%%demineralized%%% maxillaries has a direct effect on osteogenesis, affecting significantly some markers of %%%bone%%% formation such as lactate dehydrogenase activity and serum osteocalcin. Also, collagen deposition and %%%bone%%% protein turnover were markedly increased by the treatment, which may have important biological and clinical applications.
Record Date Created: 19930616
Record Date Completed: 19930616

2/7/108 (Item 108 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10422333 PMID: 1363207
Treatment of osseous defects with fibroblast-coated hydroxylapatite particles.
Feng F; Hou L T
803 Army General Hospital, Taichung, Taiwan, R.O.C.
Journal of the Formosan Medical Association = Taiwan yi zhi (HONG KONG) Nov 1992, 91 (11) p1068-74, ISSN 0929-6646--Print Journal Code: 9214933
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Several techniques of periodontal regeneration have been used, including hydroxylapatite (HA) grafting, %%%demineralized%%% free-dried %%%bone%%% allografts and guided tissue membranes, for which clinical merits still need further scientific study. The purpose of this pilot study was to examine the healing of periodontal defects using HA grafts coated with fibroblasts %%%isolated%%% from the periodontal ligament (PDL). We cultured fibroblast-like cells either from a clinically healthy site of the PDL or gingival tissues of the subject receiving the cell transplantation. We added HA to the cultures and allowed the cells to migrate onto the HA surface. Then the HA particles coated with cells were harvested and transplanted into the periodontal osseous defects of four patients after phase I treatment. Three HA grafts without coating cells were used as controls. Periapical x-ray and clinical parameters were monitored for up to six months. Scanning electron microscopy demonstrated that fibroblast-like cells had proliferated on the HA particles in vitro. Our results showed that the experimental group had greater pocket reduction and clinical attachment gain, and less gingival recession than did the control group at six months postoperatively. Periapical films revealed good filling of osseous defects in both groups. This study introduces a new biological approach for bringing PDL cells into intimate contact with root surfaces, in order to facilitate earlier repopulation of root surfaces with regenerative PDL cells.
Record Date Created: 19930324
Record Date Completed: 19930324

2/7/109 (Item 109 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10405774 PMID: 1484504
Initiation of %%%bone%%% regeneration in adult baboons by osteogenin, a %%%bone%%% morphogenetic protein.
Ripamonti U; Ma S; Cunningham N S; Yeates L; Reddi A H
Medical Research Council/University of the Witwatersrand, Johannesburg, South Africa.
Matrix (Stuttgart, Germany) (GERMANY) Nov 1992, 12 (5) p369-80, ISSN 0934-8832--Print Journal Code: 8906139
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Osteogenin, and related %%%bone%%% morphogenetic proteins, induce endochondral %%%bone%%% differentiation through a cascade of events which include formation of cartilage, hypertrophy and calcification of the cartilage, vascular invasion, differentiation of osteoblasts, and formation of %%%bone%%%. These events have been studied in a postnatal model of %%%bone%%% development in rodents. Information concerning the morphogenetic potential of osteogenin in primates is a prerequisite for potential clinical application in man. The efficacy of allogeneic osteogenin in primates was investigated in both extraskeletal and skeletal sites in 19-Chacma baboons (Papio ursinus). Osteogenin was %%%isolated%%% from %%%demineralized%%% baboon %%%bone%%% matrix and %%%purified%%% by chromatography on heparin-Sepharose, hydroxyapatite, and Sepharyl S-200. Protein fractions with a molecular mass range of 26-42 kDa induced cartilage and %%%bone%%% differentiation in the subcutaneous space of rats. Final %%%purification%%% to homogeneity was obtained by electroendosmotic elution from a preparative sodium dodecyl sulphate (SDS) polyacrylamide gel, resulting in a single band on a SDS-polyacrylamide gel with an apparent molecular mass of 30-34 kDa, with biological activity in rats. The osteoinductive potential of osteogenin in primates was tested first in intramuscular sites in baboons and found to be active. The %%%bone%%% regeneration potential was investigated in nonhealing calvarial defects surgically prepared in adult male baboons. Baboon osteogenin induced complete regeneration of the cranial wound. These findings in adult primates establish a primary role for osteogenin in initiation and promotion of osteogenesis, and imply a potential therapeutic application based on cell biology of extracellular matrix-cell interactions.
Record Date Created: 19930212
Record Date Completed: 19930212

2/7/110 (Item 110 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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10352482 PMID: 1442202
Evidence for the formation of a complex between osteopontin and osteocalcin.
Ritter N M; Farach-Carson M C; Butler W T
Department of Biological Chemistry, University of Texas Health Science Center, Houston.
Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research (UNITED STATES) Aug 1992, 7 (8) p877-85, ISSN 0884-0431--Print Journal Code: 8610640
Contract/Grant No.: 1 F32 DE05589; DE; United States NIDCR; 2 RO1 AR39273; AR; United States NIAMS; 5 R37 DE 05092, DE; United States NIDCR
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
We hypothesize that the mechanisms governing %%%bone%%% formation and remodeling involve the assembly of some of the components of the

extracellular matrix into supramolecular complexes. We have examined the associations of osteopontin (OPN) with other proteins %%%isolated%%% from %%%demineralized%%% rat long bones. Three ligand binding techniques were used to demonstrate the formation of complexes between osteopontin and osteocalcin (OCN). Using gel overlay assays, the binding between soluble 125I-OPN and OCN immobilized in acrylamide gels was visualized. Competition for 125I-OPN-OCN complexes was demonstrated when unlabeled OCN-enriched %%%bone%%% extract was included in gel overlay solutions. Also, gel overlay assays showed 125I-OCN binding to OPN. Saturable binding was shown in solid-phase filter binding assays, which yielded an equilibrium binding constant of moderately high affinity (approximately 10(-8) M). Specificity of OPN-OCN complex formation was confirmed by measuring binding in the presence of unlabeled OPN and OCN versus a %%%bone%%%-localized serum protein, alpha 2HS-glycoprotein. Finally, the formation of soluble complexes were demonstrated in a modified Hummel-Dreyer gel filtration assay. These results indicate that OPN and OCN form complexes in vitro. The possible functions of OPN-OCN complexes in osteoclast recruitment and attachment are discussed.
Record Date Created: 19921217
Record Date Completed: 19921217

2/7/111 (Item 111 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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10213613 PMID: 1629219
Bovine %%%bone%%% activin enhances %%%bone%%% morphogenetic protein-induced ectopic %%%bone%%% formation.
Ogawa Y; Schmidt D K; Nathan R M; Armstrong R M; Miller K L; Sawamura S J ; Ziman J M; Erickson K L; de Leon E R; Rosen D M; et al
Celtrix Pharmaceuticals, Palo Alto, California 94303.
Journal of biological chemistry (UNITED STATES) Jul 15 1992, 267 (20) p14233-7, ISSN 0021-9258--Print Journal Code: 2985121R
Publishing Model Print
Document type: In Vitro; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
A 25-kDa homodimeric protein was %%%purified%%% from %%%demineralized%%% bovine %%%bone%%% extract and identified as activin A. The bovine %%%bone%%% activin enhanced formation of ectopic %%%bone%%% in rat subcutis when implanted in combination with partially %%%purified%%% bovine %%%bone%%% morphogenetic protein (BMP-2, BMP-3) in collagen/ceramic carrier. The implants, removed at 14 days, contained markedly elevated levels of alkaline phosphatase activity. Histological examination revealed an extensive formation of woven %%%bone%%% with very little cartilage. In contrast, a combination of transforming growth factor-beta 2 and BMP promoted formation of %%%bone%%% with an abundance of cartilage. The implants with BMP alone exhibited some osteoinductive activity, while the implants with activin alone showed no activity. These results demonstrate that %%%bone%%% is a rich source of activin and that activin plays an important role in modulating %%%bone%%% formation.
Record Date Created: 19920814
Record Date Completed: 19920814

2/7/112 (Item 112 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10068945 PMID: 1730066
Growth and morphogenetic factors in %%%bone%%% induction: role of osteogenin and related %%%bone%%% morphogenetic proteins in craniofacial and periodontal %%%bone%%% repair.
Ripamonti U; Reddi A H
Bone Cell Biology Section, National Institute of Dental Research, National Institutes of Health, Bethesda, Maryland 20892.
Critical reviews in oral biology and medicine : an official publication of the American Association of Oral Biologists (UNITED STATES) 1992, 3 (1-2) p1-14, ISSN 1045-4411--Print Journal Code: 9009999
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
%%%Bone%%% has considerable potential for repair as illustrated by the phenomenon of fracture healing. Repair and regeneration of %%%bone%%% recapitulate the sequential stages of development. It is well known that %%%demineralized%%% %%%bone%%% matrix has the potential to induce new %%%bone%%% formation locally at a heterotopic site of implantation. The sequential development of %%%bone%%% is reminiscent of endochondral %%%bone%%% differentiation during %%%bone%%% development. The collagenous matrix-induced %%%bone%%% formation is a prototype model for matrix-cell interactions in vivo. The developmental cascade includes migration of progenitor cells by chemotaxis, attachment of cells through fibronectin, proliferation of mesenchymal cells, and differentiation of %%%bone%%%. The %%%bone%%% inductive protein, osteogenin, was %%%isolated%%% by heparin affinity chromatography. Osteogenin initiates new %%%bone%%% formation and is promoted by other growth factors. Recently, the genes for osteogenin and related %%%bone%%% morphogenetic proteins were cloned and expressed. Recombinant osteogenin is osteogenic in vivo. The future prospects for %%%bone%%% induction are bright, and this is an exciting frontier with applications in oral and orthopaedic surgery. (83 Refs.)
Record Date Created: 19920218
Record Date Completed: 19920218

2/7/113 (Item 113 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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10053390 PMID: 10171107
Osteoinductive biomaterials for medical implantation.
Toriumi D M; East C A; Larrabee W F
Division of Facial Plastic and Reconstructive Surgery, Department of Otolaryngology-Head and Neck Surgery, University of Illinois College of Medicine at Chicago 60612.
Journal of long-term effects of medical implants (UNITED STATES) 1991, 1 (1) p53-77, ISSN 1050-6934--Print Journal Code: 9110830
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The search for the ideal implant material continues since presently available implants all have significant drawbacks. This paper reviews three studies that we recently completed with %%%bone%%%-inducing implants. Long-term clinical follow-up of 75 allogeneic %%%demineralized%%% %%%bone%%% implants showed an average degree of resorption of 49%. Implants used for dorsal nasal augmentation showed an average degree of resorption of 50.7%, increasing to 82.5% after a 24-month follow-up. The efficacy of %%%demineralized%%% %%%bone%%% implants is dependent on many factors including site of implantation, method of preparation, etc. Transforming growth factor-beta 1 (TGF-beta 1) is a regulator of %%%bone%%% formation. We combined recombinant TGF-beta 1 with %%%demineralized%%% %%%bone%%% powder in a rabbit facial augmentation model. At 6 weeks, there was evidence of increased %%%bone%%% formation in the implants containing TGF-beta 1. Even though TGF-beta 1 can increase %%%bone%%% formation in %%%demineralized%%% %%%bone%%% implants, the overall %%%bone%%%-inducing activity in these implants seems to be suboptimal. Osteoinductive factor extract (OFE) is a partially %%%purified%%% %%%bone%%% factor preparation that has been shown to form %%%bone%%% when implanted into rats. Using a collagen/ceramic carrier, we implanted OFE into a rabbit facial augmentation model. At 21 d, histomorphometry revealed numerous osteoblasts and %%%bone%%% formation in the OFE implants. The %%%bone%%%-inducing activity of many partially %%%purified%%% osteoinductive preparations such as OFE is probably due to %%%Bone%%% Morphogenetic Protein-2A (BMP-2A),

which has been shown to induce %%%bone%%% formation in its recombinant form. Recombinant DNA methodology provides the technology necessary to produce these molecules in their homogeneous form, permitting evaluation of %%%bone%%% -inducing activity in a preparation free of contaminants. Finally, the ideal carrier must be devised to permit safe and effective delivery of recombinant %%%bone%%%-inducing factors.
Record Date Created: 19920625
Record Date Completed: 19920625

2/7/114 (Item 114 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10031931 PMID: 1687261
%%%Bone%%% and biologically compatible materials in dentistry.
Binderman I
Department of Dentistry and Hard Tissue Laboratory, Tel Aviv Medical Center.
Current opinion in dentistry (UNITED STATES) Dec 1991, 1 (6) p836-40
, ISSN 1046-0764--Print Journal Code: 9106559
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
This review focuses on compatible materials that are either implanted in %%%bone%%% tissue to serve as prosthetic devices or used as %%%bone%%% substitutes. It attempts to evaluate the significance of studies of combined osteoconductive materials with osteoinductive factors, like %%%demineralized%%% %%%bone%%% or its %%%purified%%% components, and osteogenic cells. It is important to note that the term osseointegration, which is still widely used by clinicians to indicate the bioactivity of implants in %%%bone%%% healing, is not substantiated by any controlled basic study. Even pure titanium and hydroxyapatite can interfere with the normal healing of a surgical %%%bone%%% wound. This review emphasizes the three-dimensional structure of %%%bone%%%, intercellular communication, and the response of this system to %%%bone%%% damage and materials.
Record Date Created: 19920521
Record Date Completed: 19920521

2/7/115 (Item 115 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

10006719 PMID: 1787832
Xenogeneic osteogenin, a %%%bone%%% morphogenetic protein, and %%%demineralized%%% %%%bone%%% matrices, including human, induce %%%bone%%% differentiation in athymic rats and baboons.
Ripamonti U; Magan A; Ma S; van den Heever B; Moehl T; Reddi A H
Medical Research Council/University of the Witwatersrand Dental Research Institute, Johannesburg, South Africa.
Matrix (Stuttgart, Germany) (GERMANY) Dec 1991, 11 (6) p404-11, ISSN 0934-8832--Print Journal Code: 8906139
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Subcutaneous implantation of xenogeneic %%%demineralized%%% %%%bone%%% matrix does not initiate endochondral %%%bone%%% differentiation. Dissociative extraction in 4 M guanidine-HCl or 6 M urea has shown that the apparent species-specificity of intact %%%bone%%% matrix resides in its insoluble immunogenic component, since there is homology in solubilized osteogenic proteins amongst mammals. To further investigate the species-specificity and cross-species reactivity of %%%bone%%% matrix components, baboon and human %%%demineralized%%% %%%bone%%% matrix (DBM) and bovine osteogenin, %%%purified%%% greater than 50,000-fold and with an apparent molecular mass of 28-42 kilodaltons, were implanted in the subcutaneous space of athymic and euthymic rats and into the rectus abdominis of 16 baboons (Papio ursinus). Baboon DBM was also implanted in athymic and euthymic mice. Alkaline phosphatase activity and histology of implants harvested at day 11 and 30 showed that baboon and human DBM induced endochondral %%%bone%%% differentiation both in athymic rats and baboons. Bovine osteogenin in conjunction with baboon insoluble collagenous matrix induced extensive %%%bone%%% differentiation in athymic rats and baboons. Baboon and human DBM did not induce %%%bone%%% differentiation in euthymic rats and, in athymic mice, baboon DBM failed to induce %%%bone%%% differentiation, determining instead the recruitment of multinucleated giant cells. The results indicate that in rodents %%%bone%%% differentiation induced by intact %%%bone%%% matrix is species specific and that T-cell functions are not a requirement for %%%bone%%% induction, although immunologically competent rats block %%%bone%%% differentiation from xenogeneic matrix. %%%Bone%%% differentiation induced by human DBM in baboons suggests that intact %%%bone%%% matrices may not be species-specific amongst primates.(ABSTRACT TRUNCATED AT 250 WORDS)
Record Date Created: 19920320
Record Date Completed: 19920320

2/7/116 (Item 116 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09981195 PMID: 1685082
Structural characterization of human alveolar %%%bone%%% proteoglycans.
Waddington R J; Embery G
Department of Basic Dental Science, Dental School, University of Wales College of Medicine, Heath Park, Cardiff, U.K.
Archives of oral biology (ENGLAND) 1991, 36 (12) p859-66, ISSN 0003-9969--Print Journal Code: 0116711
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Proteoglycans were extracted from EDTA-%%%demineralized%%% human alveolar %%%bone%%% under dissociative conditions using 4 M guanidinium chloride in the presence of protease inhibitors. The extract was further %%%purified%%% by anion-exchange chromatography on DEAE-Sephacel, using a step-wise salt gradient. The proteoglycan-rich fraction was analysed for carbohydrate, protein and amino acid composition and molecular size by SDS-PAGE. Glycosaminoglycan content was determined by cellulose acetate electrophoresis after proteolysis. The sulphate isomers of the glycosaminoglycans were confirmed by Fourier-transformed infra-red spectroscopy. Two chondroitin sulphate-proteoglycan species were identified with molecular weights of 79 and 55-65 kDa, respectively. The core proteins had molecular weights of 49 kDa for both proteoglycans, with the amino acid content rich in glycine, leucine, glutamate and aspartate. The chondroitin sulphate chains were mainly as the 4-sulphate isomer forms although low but detectable amounts of 6-sulphate isomer were also present.
Record Date Created: 19920218
Record Date Completed: 19920218

2/7/117 (Item 117 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09961688 PMID: 1753322 Record Identifier: 92092153
Histologic comparison of regeneration in human intrabony defects when osteogenin is combined with %%%demineralized%%% freeze-dried %%%bone%%% allograft and with %%%purified%%% bovine collagen.
Bowers G; Felton F; Middleton C; Glynn D; Sharp S; Mellonig J; Corio R; Emerson J; Park S; Suzuki J; et al
Department of Periodontics, University of Maryland, Baltimore College of Dental Surgery.

Journal of periodontology (UNITED STATES) Nov 1991, 62 (11) p690-702
, ISSN 0022-3492--Print Journal Code: 8000345
Contract/Grant No.: DE-07204; DE: United States NIDCR
Publishing Model Print
Document type: Comparative Study; Journal Article; Research Support, U.S. Gov't, Non-P.H.S.; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE, Completed

A %%%bone%%%-inductive protein, osteogenin, has been %%%isolated%%% from long bones of humans and offers promise as a grafting material. Studies, however, suggest that osteogenin must be combined with a %%%bone%%%-derived matrix in order to initiate %%%bone%%% differentiation. The purpose of this study was to determine if osteogenin combined with %%%demineralized%%% freeze dried %%%bone%%% allograft (DFDBA), a %%%bone%%%-derived matrix, and with a bovine tendon-derived matrix will enhanced regeneration of intrabony defects in humans. The tendon-derived matrix and DFDBA used alone served as controls. The ability of each material to form a new attachment apparatus was evaluated independently in submerged and nonsubmerged environments in 2 patient populations. Lymphocyte testing was performed to assess development of an immune reaction to osteogenin. The most apical level of calculus on the root served as the histologic reference point to measure regeneration. Biopsies were obtained at 6 months and regeneration was measured histomorphometrically by 2 blinded evaluators. Serial sections from 36 submerged defects in 8 patients and 50 nonsubmerged defects in 6 patients were submitted for statistical analysis. Mean results indicate that osteogenin combined with DFDBA significantly enhanced regeneration of a new attachment apparatus and component tissues in a submerged environment. DFDBA plus osteogenin and DFDBA alone formed significantly more new attachment apparatus and component tissues than either the tendon-derived matrix plus osteogenin or the tendon-derived matrix alone in both submerged and nonsubmerged environments. There were no significant differences between the tendon-derived matrix plus osteogenin and the tendon-derived matrix alone in either the submerged or nonsubmerged environment. Osteogenin does not impair normal lymphocyte blastogenesis at 6 months postsurgical challenge.
Record Date Created: 19920124
Record Date Completed: 19920124

2/7/118 (Item 118 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09934205 PMID: 1953701 Record Identifier: 92062032
Parallels between development of embryonic and matrix-induced endochondral %%%bone%%%.
Carrington J L; Reddi A H
Uniformed Services University of the Health Sciences, Anatomy Department, F. Edward Hebert School of Medicine, Bethesda, MD 20814.
BioEssays - news and reviews in molecular, cellular and developmental biology (ENGLAND) Aug 1991, 13 (8) p403-8, ISSN 0265-9247--Print Journal Code: 8510851
Publishing Model Print
Document type: Journal Article; Review
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE, Completed

Endochondral %%%bone%%% formation can take place in the embryo, during fracture healing, or in postnatal animals after induction by implanted %%%demineralized%%% %%%bone%%% matrix. This matrix-induced %%%bone%%% formation recapitulates the embryonic sequence of %%%bone%%% formation morphologically and biochemically. The steps in %%%bone%%% formation in both systems include differentiation of cartilage from mesenchyme, cartilage maturation, invasion of the cartilage by blood vessels and marrow precursors, and formation of %%%bone%%% and %%%bone%%% marrow. Recently, %%%bone%%% inductive molecules from %%%demineralized%%% %%%bone%%% matrix have been %%%purified%%%, sequenced and produced as recombinant proteins. While there are similarities between %%%bone%%% development in the embryo and that after induction by these %%%purified%%% molecules, the molecules responsible for %%%bone%%% induction in the embryo have not yet been defined. Because of similarities between the two methods of %%%bone%%% formation, studies of %%%bone%%% induction by %%%demineralized%%% %%%bone%%% matrix may help to elucidate mechanisms of embryonic %%%bone%%% induction. (40 Refs.)
Record Date Created: 19911213
Record Date Completed: 19911213

2/7/119 (Item 119 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09914224 PMID: 1938474
Immunohistochemical localization of %%%bone%%% sialoprotein in foetal porcine %%%bone%%% tissues: comparisons with secreted phosphoprotein 1 (SPP-1, osteopontin) and SPARC (osteonectin).
Chen J; Zhang Q; McCulloch C A; Sodek J
Medical Research Council Group in Periodontal Physiology, Faculty of Dentistry, University of Toronto, Ontario, Canada.
Histochemical journal (ENGLAND) Jun 1991, 23 (6) p281-9, ISSN 0018-2214--Print Journal Code: 0163161
Publishing Model Print
Document type: Comparative Study; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE, Completed

%%%Bone%%% sialoprotein (BSP) is a prominent component of %%%bone%%% tissues that is expressed by differentiated osteoblastic cells. Affinity-%%%purified%%% antibodies to BSP were prepared and used in combination with biotin-conjugated peroxidase-labeled second antibodies to demonstrate the distribution of this protein in sections of %%%demineralized%%% foetal porcine tibia and calvarial %%%bone%%%. Staining for BSP was observed in the matrix of mineralized %%%bone%%% and also in the mineralized cartilage and associated cells of the epiphysis, but was not observed in the hypertrophic zone nor in any of the soft tissues including the periosteum. In comparison, SPP-1 (osteopontin) and SPARC (osteonectin), which are also major proteins in porcine %%%bone%%%, were observed in the cartilage as well as in the mineralized %%%bone%%% matrix. In addition, SPARC was also present in soft connective tissues. Although SPP-1 distribution was more restricted than SPARC, hypertrophic chondrocytes, periosteal cells and some stromal cells in the %%%bone%%% marrow spaces were stained in addition to osteoblastic cells. The variations in the distribution and cellular expression of BSP, SPARC and SPP-1 in %%%bone%%% and mineralizing cartilage indicate these proteins perform different functions in the formation and remodelling of mineralized connective tissues.
Record Date Created: 19911211
Record Date Completed: 19911211

2/7/120 (Item 120 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09872129 PMID: 1895472 Record Identifier: 91374707
Tissue transformation into %%%bone%%% in vivo. A potential practical application.
Khouri R K; Koudsi B; Reddi H
Department of Surgery, Washington University School of Medicine, St Louis, Mo. 63110.
JAMA - the journal of the American Medical Association (UNITED STATES) Oct 9 1991, 266 (14) p1953-5, ISSN 0098-7484--Print Journal Code: 7501160
Contract/Grant No.: 22-3335 44901A; United States PHS
Publishing Model Print

Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed

The transformation of mesenchymal tissue, such as muscle, into cartilage and %%%bone%%% can be induced by the recently %%%purified%%% osteoinductive factor, osteogenin, and by its parent substratum, %%%demineralized%%% %%%bone%%% matrix. We investigated the possibility of transforming readily available muscle flaps into vascularized %%%bone%%% grafts of various shapes that could be used as skeletal replacement parts. In a rat experimental model, thigh adductor muscle island flaps were placed inside bivalved silicone rubber molds. Prior to closure of the mold, 18 flaps were injected with osteogenin and coated with %%%demineralized%%% %%%bone%%% matrix. Five flaps served as controls and were injected with the vehicle only, and not coated with %%%demineralized%%% %%%bone%%% matrix. The molds were implanted subcutaneously in the rats' flanks and reopened 10 days later. The control flaps consisted of intact muscle without any evidence of tissue transformation, whereas the flaps treated with osteogenin and %%%demineralized%%% %%%bone%%% matrix were entirely transformed into cancellous %%%bone%%% that matched the exact shape of the mold. Using tissue transformation, we were able to generate in vivo, autogenous, well-perfused bones in the shapes of femoral heads and mandibles.

Record Date Created: 19911021
Record Date Completed: 19911021

2/7/121 (Item 121 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09843414 PMID: 1875692 Record Identifier: 91342210

Recent progress in %%%bone%%% induction by osteogenin and %%%bone%%% morphogenetic proteins: challenges for biomechanical and tissue engineering.

Reddi A H; Cunningham N S
Bone Cell Biology Section, National Institute of Dental Research, National Institutes of Health, Bethesda, MD 20892.
Journal of biomechanical engineering (UNITED STATES) May 1991, 113 (2) p189-90, ISSN 0148-0731--Print Journal Code: 7909584
Publishing Model Print
Document type: Journal Article; Review
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed

Implantation of %%%demineralized%%% %%%bone%%% matrix results in local %%%bone%%% induction. %%%Bone%%% induction is a sequential biological chain reaction that consists of chemotaxis and proliferation of mesenchymal cells and differentiation of %%%bone%%%. Osteogenin, a %%%bone%%% morphogenetic protein has been %%%purified%%% and the amino acid sequence determined. Recently a family of %%%bone%%% morphogenetic proteins have been cloned and expressed by recombinant DNA technology. The availability of growth and morphogenetic factors will permit the rational design of new %%%bone%%%. The challenge for the biomechanical engineer is to attain mechanically optimal and functionally adaptive new %%%bone%%% for various skeletal prostheses. We are on the threshold for fabrication of new %%%bone%%% based on sound architectural design principles of tissue engineering based on cellular and molecular biology of growth and differentiation factors. (15 Refs.)

Record Date Created: 19910920
Record Date Completed: 19910920

2/7/122 (Item 122 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09827446 PMID: 1864859

A rat incisor dentin matrix protein can induce neonatal rat muscle fibroblasts, in culture, to express phenotypic products of chondroblastic cells.

Arnar S; Sires B; Veis A
Division of Oral Biology, Northwestern University Dental School, Chicago, Illinois 60611.
Journal de biologie buccale (FRANCE) Mar 1991, 19 (1) p55-60, ISSN 0301-3952--Print Journal Code: 0400336
Contract/Grant No.: DE 01374; DE; United States NIDCR
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed

%%%Demineralized%%% dentin matrix induces the ectopic formation of %%%bone%%%, in vivo, when implanted subcutaneously or in muscle pouches. In these situations the %%%bone%%% induction follows a chondrogenic pathway. As part of the strategy for the assay and %%%isolation%%% of the factors responsible for initiating induction, we have developed a cell culture system in which the addition of soluble factors extracted from the dentin matrix appears to initiate chondrogenesis. Indicators of chondrogenesis, relative to control cultures, were taken as an increase of 35S-sulfate incorporation into proteoglycan (PG), an altered size of the PG, production of type II collagen, and changes in cell morphology and matrix histochemistry. Our studies have taken two directions: the use of the cell culture system under standard conditions to select fractions inducing one or more of the above indica-tors; and, the %%%purification%%% and characterization of the in vitro chondrogenesis inducing factor(s). Here we report the identification of a peptide fraction which acts in culture to satisfy each of the above indicators of chondrogenesis. An EDTA extract of rat incisor dentin was fractionated by CaCl2 precipitation, Sephacryl S-100 chromatography, and reverse phase HPLC. A single peptide fraction from the HPLC, evidenced by the existence of a single spot on 2-D Gel Electrophoresis, was found to be a potent enhancer of 35S-sulfate incorporation during the standard assay, with maximal activity in the 1-10 ng/ml range. Further detailed studies showed that the heightened incorporation occurred without any increase in cell number. The neonatal rat muscle explant fibroblasts exposed to this fraction for 7 days in monolayer culture formed dense cell nodules which stained intensely with Alcian blue relative to controls.(ABSTRACT TRUNCATED AT 250 WORDS)

Record Date Created: 19910911
Record Date Completed: 19910911

2/7/123 (Item 123 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09826826 PMID: 1713866

Osteogenin (%%%bone%%% morphogenetic protein-3) stimulates cartilage formation by chick limb bud cells in vitro.

Carrington J L; Chen P; Yanagishita M; Reddi A H
Department of Anatomy and Cell Biology, Uniformed Services University of the Health Sciences, Bethesda, Maryland 20889-4799.
Developmental biology (UNITED STATES) Aug 1991, 146 (2) p406-15, ISSN 0012-1606--Print Journal Code: 0372762
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, Non-P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed

Osteogenin is a protein %%%isolated%%% from %%%demineralized%%% bovine %%%bone%%% matrix. When implanted in rats, osteogenin induces the differentiation of cartilage and formation of endochondral %%%bone%%%. When added to stage 24 and 25 chick limb bud mesoderm cells in culture, it stimulated synthesis of sulfated proteoglycans by over 10-fold without stimulating cell division. The increase was detected after only 2 days in culture. Morphologically, in the presence of osteogenin, all cells in the culture appeared to form cartilage, rather than the nodules of cartilage surrounded by noncartilage areas in control cultures. The distribution of

type II collagen correlated with the morphological differentiation of cartilage. When nonchondrocyte and chondrocyte cell populations were separated, osteogenin stimulated sulfated proteoglycan synthesis in all populations of cells. However, the greatest stimulation (24-fold) was seen in the originally nonchondrocyte population, which apparently still had some potential to form cartilage. In this study, chick limb bud mesoderm cells in vitro responded to osteogenin, a protein derived from adult bovine %%%bone%%% matrix. The cells that were responsive included those that initially did not form cartilage. Osteogenin belongs to a superfamily of proteins, many of which are important in development. It is possible that osteogenin has a role in embryonic cartilage development.
Record Date Created: 19910909
Record Date Completed: 19910909

2/7/124 (Item 124 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09825804 PMID: 1650618
Altered differentiation of limb bud cells by transforming growth factors-beta %%%isolated%%% from %%%bone%%% matrix and from platelets.
Schonfeld H J; Poschl B; Wessner B; Kistler A
Central Research Unit, F. Hoffmann-La Roche Ltd., Basle, Switzerland.
Bone and mineral (NETHERLANDS) Jun 1991, 13 (3) p171-89, ISSN 0169-6009--Print Journal Code: 8610542
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
A crude extract of %%%demineralized%%% %%%bone%%% matrix caused an altered differentiation of limb bud cells which was seen within 5 days in culture. Using this bioassay system we %%%purified%%% two factors to homogeneity and found that according to their N-terminal sequences they corresponded to TGF-beta 1 and TGF-beta 2 %%%isolated%%% from platelets. Biochemical analyses and biological studies (molecular mass determination, inactivation by reducing agents and proteases, antibody neutralization, competitive binding to TGF-beta receptors and influence on protein expression) provided additional evidence that the two proteins %%%isolated%%% from %%%demineralized%%% %%%bone%%% matrix were apparently identical to TGF-beta 1 and TGF-beta 2. Proteoglycan content, alkaline phosphatase activity and response of the cells to PTH stimulated adenylate cyclase were quantitatively changed by the factors. Culturing limb bud cells on polycarbonate membranes resulted in a rapid and extensive growth and differentiation of the cells to palpable tissue pieces. Relative to controls distinct cell and tissue morphology was observed macroscopically and in histological sections of these tissue pieces.
Record Date Created: 19910912
Record Date Completed: 19910912

2/7/125 (Item 125 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09800319 PMID: 2066624
[Partial %%%purification%%% and characterization of %%%bone%%%-resorbing factor from bovine %%%bone%%% matrix]
Mori M
Second Department of Oral Surgery, Faculty of Dentistry, Tokyo Medical and Dental University.
Kokubyo Gakkai zasshi. The Journal of the Stomatological Society, Japan (JAPAN) Mar 1991, 58 (1) p155-68, ISSN 0300-9149--Print Journal Code: 0413677
Publishing Model Print
Document type: English Abstract; Journal Article
Languages: JAPANESE
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The mechanism of %%%bone%%% remodeling has been investigated by many researchers. However, little is known about the role of the local factors which exist in the %%%bone%%% matrix. In this study, the author attempted to %%%purify%%% the %%%bone%%%-resorbing factor from the bovine %%%bone%%% matrix and to find its role in %%%bone%%% remodeling. The %%%demineralized%%% bovine %%%bone%%% matrix was extracted with 4M Gdn-HCl and the %%%bone%%%-resorbing factor was %%%purified%%% by means of heparin affinity and gel filtration chromatography. The analysis of %%%bone%%% resorption was carried out by the measurement of the released 45Ca from the pre-labeled mouse calvariae. The results of this study were that the %%%bone%%%-resorbing factor in the %%%bone%%% matrix was suggested to be a heat-stable glycoprotein having a molecular size higher than 150,000, which stimulated osteoclastic %%%bone%%% resorption via a prostaglandin-mediated mechanism.
Record Date Created: 19910815
Record Date Completed: 19910815

2/7/126 (Item 126 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09797961 PMID: 2065078 Record Identifier: 91291859
Alkaline phosphatase from rat osseous plates: %%%purification%%% and biochemical characterization of a soluble form.
Say J C; Ciulli K; Furriel R P; Ciancaglini P; Leone F A
Departamento de Quimica - Faculdade de Filosofia Ciencias e Letras de Ribeirao Preto, Universidade de Sao Paulo, Brasil.
Biochimica et biophysica acta (NETHERLANDS) Jul 8 1991, 1074 (2) p256-62, ISSN 0006-3002--Print Journal Code: 0217513
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
A soluble form of an alkaline phosphatase obtained from rat osseous plates was %%%purified%%% 204-fold with a yield of 24.3%. The %%%purified%%% enzyme showed a single protein band of Mr 80,000 on SDS-PAGE and an apparent molecular weight of 163,000 by gel filtration on Sephacryl S-300 suggesting a dimeric structure for the soluble enzyme. The specific activity of the enzyme at pH 9.4 in the presence of 2 mM MgCl2 was 19.027 U/mg and the hydrolysis of p-nitrophenyl phosphate (K0.5 = 92 microM) showed positive cooperativity (n = 1.5). The %%%purified%%% enzyme showed a broad substrate specificity, however, ATP, bis(p-nitrophenyl) phosphate and pyrophosphate were among the less hydrolyzed substrates assayed. Surprisingly the enzyme was not stimulated by cobalt and manganese ions, in contrast with a 20-25% stimulation observed for magnesium and calcium ions. Zinc ions exerted a strong inhibition on p-nitrophenylphosphatase activity of the enzyme. This paper provides a simple experimental procedure for the %%%isolation%%% of a soluble form of alkaline phosphatase which is induced by %%%demineralized%%% %%%bone%%% matrix during endochondral ossification.
Record Date Created: 19910815
Record Date Completed: 19910815

2/7/127 (Item 127 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09782314 PMID: 2054066 Record Identifier: 91273764
Proteins in the fossil %%%bone%%% of the dinosaur, Seismosaurus.
Gurley L R; Valdez J G; Spall W D; Smith B F; Gillette D D
Life Sciences Division, Los Alamos National Laboratory, New Mexico 87545.
Journal of protein chemistry (UNITED STATES) Feb 1991, 10 (1) p75-90, ISSN 0277-8033--Print Journal Code: 8217321
Publishing Model Print
Document type: Journal Article

Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Proteins have been successfully extracted from the fossil vertebra of a 150-million-year-old sauropod dinosaur ("Seismosaurus") recently excavated from the Morrison Formation of New Mexico. HCl and guanidine.HCl extracts of the fossil %%%bone%%% and its sandstone matrix were concentrated, %%%demineralized%%% , and resolved into a number of different protein fractions by reversed-phase high-performance liquid chromatography (HPLC). One of these fractions had the same retention time as collagen. Amino acid analysis (Pico-Tag method) of these fractions confirmed they were proteins. Comparison of the correlation coefficients of the amino acid analyses with that of collagen standards indicated that none of the fractions contained significant amounts of collagen. Similar HPLC profiles were obtained for the HCl extracts of fossil %%%bone%%% and its sandstone matrix suggesting they contained the same proteins. However, different HPLC profiles were obtained when these HCl extracts were dried and reextracted with guanidine.HCl. These different fractions represent proteins unique to the fossil and were not found in the sandstone matrix. These differences were confirmed by amino acid analysis. Such information on fossil %%%bone%%% proteins might provide useful knowledge concerning the evolution of skeletal molecules and the fossilization process. Similar information on the proteins from the geological matrix might provide useful fingerprints for reconstructing ancient environments and for assessing sedimentary rocks for fossil fuel exploration.
Record Date Created: 19910801
Record Date Completed: 19910801

2/7/128 (Item 128 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09766497 PMID: 2043127 Record Identifier: 91254312
Changes in the gene expression of collagens, fibronectin, integrin and proteoglycans during matrix-induced %%%bone%%% morphogenesis.
Yu Y M; Becvar R; Yamada Y; Reddi A H
Bone Cell Biology Section, National Institute of Dental Research, National Institutes of Health, Bethesda, Maryland 20892.
Biochemical and biophysical research communications (UNITED STATES) May 31 1991, 177 (1) p427-32, ISSN 0006-291X--Print Journal Code: 0372516
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Subcutaneous implantation of %%%demineralized%%% %%%bone%%% matrix in rat results in the local cartilage and %%%bone%%% development. This in vivo model of %%%bone%%% formation was used to examine the expression patterns of cartilage and %%%bone%%% specific extracellular matrix genes. The steady state levels of mRNA in implants for cartilage specific type II collagen, type IX collagen, proteoglycan link protein and cartilage proteoglycan core protein (aggrecan) were increased during chondrogenesis and cartilage hypertrophy. Fibronectin mRNA levels were high during mesenchymal cell migration, attachment and chondrogenesis. Integrin (beta 1 chain) mRNA was expressed throughout the endochondral %%%bone%%% development. Type I collagen mRNA levels in implants increased as early as day 3, reached its peak during osteogenesis. These gene markers will be useful in the study of the mechanism of action of %%%bone%%% morphogenetic proteins present in the %%%demineralized%%% %%%bone%%% matrix.
Record Date Created: 19910705
Record Date Completed: 19910705

2/7/129 (Item 129 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09737184 PMID: 1902476
The %%%isolation%%% and partial characterization of a rat incisor dentin matrix polypeptide with in vitro chondrogenic activity.
Amar S; Sires B; Sabsay B; Clohisy J; Veis A
Connective Tissue Research Laboratory, Northwestern University, Chicago, Illinois 60611.
Journal of biological chemistry (UNITED STATES) May 5 1991, 266 (13) p8609-18, ISSN 0021-9258--Print Journal Code: 2985121R
Contract/Grant No.: DE 01374; DE; United States NIDCR; DE 08525, DE; United States NIDCR
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
In vivo implants of %%%demineralized%%% dentin matrix into muscle induce the formation of %%%bone%%% within the muscle. As with %%%bone%%% matrix implants, the %%%bone%%% induction appears to follow a chondrogenic pathway. Outgrowth cells from explants of neonatal rat muscle respond to %%%bone%%% matrix, in vitro, by expressing a heightened synthesis of sulfated proteoglycans and type II collagen, phenotypic of cartilage. The in vitro cell culture system has been used as an assay to monitor the %%%isolation%%% of the factor responsible for expression of this phenotypic transformation. Soluble proteins extracted from rat incisor dentin matrix during demineralization with EDTA, and not precipitable with 1.0 M CaCl2, were active in the in vitro system. The active extract was fractionated by Sephacryl S-100 chromatography in 6 M guanidine HCl, isoelectric focusing in immobilines, and by reverse phase high performance liquid chromatography. All fractions were assayed for activity at every stage. The final active fraction from the reverse phase chromatography on a Zorbax Poly-F column was %%%purified%%% to homogeneity, and yielded a single spot on two-dimensional gel electrophoresis. The component, RP-4, had pI 5.4-5.5, and an apparent Mr 6,000-10,000, based on globular protein standards. Maximal activity with respect to both sulfate incorporation into proteoglycan and production of type II collagen was in the 1.0-10 ng/ml range. The RP-4 had a unique amino-terminal amino sequence and was rich in Gly, Pro, Glx, and Ala residues. It was different from transforming growth factor-beta and the %%%bone%%% morphogenetic protein family of proteins in these essential features.
Record Date Created: 19910605
Record Date Completed: 19910605

2/7/130 (Item 130 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09706870 PMID: 2002426
In vitro chemotactic response of osteoblast-like osteosarcoma cells to a partially %%%purified%%% protein extract of %%%demineralized%%% %%%bone%%% matrix.
Padley R A; Cobb C M; Killoy W J; Newhouse N L; Boyan B D
School of Dentistry, Department of Periodontics, University of Missouri-Kansas City.
Journal of periodontology (UNITED STATES) Jan 1991, 62 (1) p15-20, ISSN 0022-3492--Print Journal Code: 8000345
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The purpose of this investigation was to evaluate the chemotactic potential of a partially %%%purified%%% protein extract from %%%bone%%% matrix when tested against osteosarcoma cells with osteoblast characteristics. The chemotactic response of ROS 17/2 cells to a lyophilized bovine %%%bone%%% extract %%%purified%%% to "Urist step eight" was evaluated in Boyden blind well chambers. A checkerboard design was employed to test cell migration against positive, negative, and no concentration gradients, thereby controlling the effects of chemokinesis and/or random migration on results. The results demonstrate that the

partially %%%purified%%% protein extract from bovine %%%bone%%% matrix is chemotactic since more cells migrated to positive gradients than to negative gradients (P less than .01). The chemotactic effect was confirmed by an increase in cell migration toward positive gradients of the %%%bone%%% extract compared to cell migration in the presence of no gradient (P less than .01). When no gradient was present, the cells exhibited an increased response in the presence of equal concentrations of the %%%bone%%% extract (P less than .01) indicating a chemokinetic effect. The proteinaceous nature of the chemoattractant was confirmed by its susceptibility to trypsin digestion and heat exposure.
Record Date Created: 19910412
Record Date Completed: 19910412

2/7/131 (Item 131 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09577326 PMID: 2263636
Identification of transforming growth factor beta family members present in %%%bone%%%-inductive protein %%%purified%%% from bovine %%%bone%%%.
Celeste A J; Iannazzi J A; Taylor R C; Hewick R M; Rosen V; Wang E A; Wozney J M
Genetics Institute, Inc., Cambridge, MA 02140.
Proceedings of the National Academy of Sciences of the United States of America (UNITED STATES) Dec 1990, 87 (24) p9843-7, ISSN 0027-8424--Print Journal Code: 7505876
Publishing Model: Print
Document type: Comparative Study; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Characterization of the polypeptides present in %%%bone%%%-inductive protein extracts from bovine %%%bone%%% has led to the cloning of seven regulatory molecules, six of which are distantly related to transforming growth factor beta. The three human %%%bone%%% morphogenetic proteins (BMPs) we describe herein, BMP-5, BMP-6, and BMP-7, show extensive sequence similarity to BMP-2, a molecule that by itself is sufficient to induce de novo %%%bone%%% formation in vivo. The additive or synergistic contribution of these BMP-2-related molecules to the osteogenic activity associated with %%%demineralized%%% %%%bone%%% is strongly implicated by the presence of these growth factors in the most active fractions of highly %%%purified%%% %%%bone%%% extract.
Record Date Created: 19910207
Record Date Completed: 19910207

2/7/132 (Item 132 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09557763 PMID: 2250045
Gene expression during endochondral %%%bone%%% development: evidence for coordinate expression of transforming growth factor beta 1 and collagen type I.
Bortell R; Barone L M; Tassinari M S; Lian J B; Stein G S
Department of Cell Biology, University of Massachusetts Medical Center, Worcester 01655.
Journal of cellular biochemistry (UNITED STATES) Oct 1990, 44 (2) p81-91, ISSN 0730-2312--Print Journal Code: 8205768
Contract/Grant No.: AR33920; AR; United States NIAMS; AR35166; AR; United States NIAMS; GM32010; GM; United States NIGMS;
Publishing Model: Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Subcutaneous implantation of %%%demineralized%%% %%%bone%%% particles (DBP) into rats induces the formation of a %%%bone%%% ossicle by a tightly controlled sequence of chondro- and osteo-inductive events which are directly comparable to those which occur in normal endochondral %%%bone%%% development. Although the morphological and biochemical sequence associated with endochondral %%%bone%%% formation in this model has been well characterized, to date little information is available as to the gene regulation by which these events occur. To examine the expression of genes in this system, RNA was %%%isolated%%% from implants every 2 days over a time course spanning 3 to 19 days after implantation of DBP into rats. Cellular levels of mRNA transcripts of cell-growth-regulated and tissue-specific genes were examined by slot blot analysis and compared to the morphological changes occurring during formation of the ossicle. Analysis of the mRNA levels of histone H4 and c-myc, markers of proliferative activity, revealed several periods of actively proliferating cells, corresponding to 1) production of fibroprogenitor cells (day 3), 2) onset of %%%bone%%% formation (day 9), and 3) formation of %%%bone%%% marrow (day 19). The mRNA levels of collagen type II, a phenotypic marker of cartilage, peaked between days 7 and 9 post-implantation, corresponding to the appearance of chondrocytes in the implant, and rapidly declined on day 11 (to 5% of maximum value) when %%%bone%%% formation was observed. The peak mRNA levels of collagen type I, found in fibroblasts and osteoblasts, occurred first with the onset of %%%bone%%% formation (days 7-10) and again during formation of %%%bone%%% marrow (day 19). This study has demonstrated that the temporal patterns of mRNA expression of cartilage type II and %%%bone%%% type I collagens coincide with the morphological sequence in this model of endochondral %%%bone%%% formation. Further, the mRNA levels of transforming growth factor beta 1 (TGF beta) were compared to those of collagen types I and II; a direct temporal correlation of TGF beta mRNA levels with that of collagen type I was found throughout the developmental time course. This observation of a tightly coupled relationship between TGF beta and type I collagen mRNA levels is consistent with a functional role for TGF beta in extracellular matrix production during in vivo %%%bone%%% formation.
Record Date Created: 19910115
Record Date Completed: 19910115

2/7/133 (Item 133 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09551370 PMID: 2245438 Record Identifier: 91059370
Characterization of %%%bone%%%-derived chondrogenesis-stimulating activity on embryonic limb mesenchymal cells in vitro.
Gawande S R; Tuan R S
Department of Biology, University of Pennsylvania, Philadelphia 19104.
Cell and tissue kinetics (ENGLAND) Sep 1990, 23 (5) p375-90, ISSN 0008-8730--Print Journal Code: 0174107
Contract/Grant No.: HD 15306; HD; United States NICHD; HD 15822; HD; United States NICHD; HD 17887; HD; United States NICHD
Publishing Model: Print
Document type: Comparative Study; Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, Non-P.H.S.; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
%%%Demineralized%%% %%%bone%%% matrix contains factors which stimulate chondrogenesis and osteogenesis in vivo. A water-soluble extract of %%%bone%%% has been shown to stimulate chondrogenesis in vitro in embryonic limb mesenchymal cells (Syftestad, Lucas & Caplan, 1985). The aim of this study was to analyse the cellular mechanism of the %%%bone%%%-derived chondrogenesis-stimulating activity, with particular attention on how normal requirements for chondrogenesis may be altered. The effects of bovine %%%bone%%% extract (BBE) on chondrogenesis in vitro were studied using micromass cultures of chick limb bud mesenchyme %%%isolated%%% from embryos at Hamburger-Hamilton (HH) stage 23/24, an experimental system which is capable of undergoing chondrogenic differentiation. Bovine diaphyseal long bones were %%%demineralized%%% and extracted with guanidine-HCl to prepare BBE (Syftestad & Caplan, 1984). High-density

mesenchyme cultures (30 x 10(6) cells/ml) were exposed to different doses of BBE (0.01-1.0 mg ml-1) and chondrogenesis was quantified based on cartilage nodule number and [35S]sulphate incorporation. BBE was tested on micromass cultures of varying plating densities (2-30 x 10(6) cells/ml), on cultures of 'young' limb bud cells (HH stage 17/18), and on cultures enriched with chondroprogenitor cells obtained from subridge mesoderm. Since poly-L-lysine (PL) has recently been shown (San Antonio & Tuan, 1986) to promote chondrogensis, PL and BBE were introduced together in different doses, in the culture medium, to determine if their actions were synergistic. Our results show that BBE stimulates chondrogenesis in a dose-dependent manner and by a specific, direct action on the chondroprogenitor cells but not in normally non-chondrogenic, low density or 'young' limb bud cell cultures. The effects of PL and BBE are additive and these agents appear to act by separate mechanisms to stimulate chondrogenesis; PL primarily enhances nodule formation, and BBE appears to promote nodule growth.
Record Date Created: 19910110
Record Date Completed: 19910110

2/7/134 (Item 134 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09522137 PMID: 2224594 Record Identifier: 91028853
Radiation-sterilized insoluble collagenous %%%bone%%% matrix is a functional carrier of osteogenin for %%%bone%%% induction.
Katz R W; Fetthousen G C; Reddi A H
Clinical Investigations and Patient Care Branch, National Institute of Dental Research, National Institutes of Health, Bethesda, MD 20014.
Calcified tissue international (UNITED STATES) Sep 1990, 47 (3) p183-5, ISSN 0171-967X--Print Journal Code: 7905481
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
The influence of gamma radiation on the role of the collagenous substratum as a carrier for proteins which cause %%%bone%%% induction was examined. Osteoinductive %%%demineralized%%% %%%bone%%% matrix was extracted by 4 M guanidinium hydrochloride. The insoluble collagenous %%%bone%%% matrix (ICBM) obtained was not osteoinductive, however, when reconstituted with partially %%%purified%%% osteogenin, %%%bone%%% induction was restored. In order to apply the principle of %%%bone%%% induction to clinical use, methods of sterilization must be optimized to maintain the osteoinductive activity of %%%bone%%% allografts. The inactive substratum was irradiated and reconstituted with an active, partially %%%purified%%% %%%bone%%% extract and bioassayed. Irradiation of the ICBM by a Cobalt 60 source at a dose of 1 and 3 Mrads had no deleterious effect on the functional role of the substratum.
Record Date Created: 19901206
Record Date Completed: 19901206

2/7/135 (Item 135 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09512443 PMID: 2103731 Record Identifier: 91018047
Repair of calvarial nonunions by osteogenin, a %%%bone%%%-inductive protein.
Mark D E; Hollinger J O; Hastings C; Chen G; Marden L J; Reddi A H
Department of Physiology, United States Army Institute of Dental Research, Washington, D.C.
Plastic and reconstructive surgery (UNITED STATES) Oct 1990, 86 (4) p623-30; discussion 631-2, ISSN 0032-1052--Print Journal Code: 1306050
Publishing Model Print; Comment in Plast Reconstr Surg. 1991 Jul;88(1):173-4; Comment in PMID 2052652
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Efforts were taken to determine the dose of bovine osteogenin (OG) that would induce more %%%bone%%% than that induced by 20 mg of rat particulate %%%demineralized%%% %%%bone%%% matrix (DBM), the amount allowed by the confines of an 8-mm rat craniotomy defect. Dose-response studies were performed for %%%demineralized%%% %%%bone%%% matrix alone and osteogenin, partially %%%purified%%% from bovine %%%demineralized%%% %%%bone%%% matrix,
plus rat insoluble collagenous %%%bone%%% matrix (M). %%%Demineralized%%% %%%bone%%% matrix alone (2.5, 5.0, 10, 20, or 40 mg) or osteogenin (0.0625, 0.125, 0.250, 0.50, or 1.0 mg) plus 25 mg insoluble collagenous %%%bone%%% matrix was implanted into the pectoralis muscle for 3, 5, and 7 weeks. Both materials induced time- and dose-dependent formation of %%%bone%%%. The three highest dosages of osteogenin (plus insoluble collagenous %%%bone%%% matrix) induced more %%%bone%%% than 20 mg %%%demineralized%%% %%%bone%%%
matrix and seemed to accelerate %%%bone%%% repair. However, when implanted into the 8-mm rat craniotomy defect for 4 weeks, 20 mg %%%demineralized%%% %%%bone%%% matrix and 0.5 mg osteogenin (plus insoluble collagenous %%%bone%%% matrix) induced comparable amounts of %%%bone%%%. These results suggest different mechanisms for %%%bone%%% formation in heterotopic and orthotopic sites.
Record Date Created: 19901116
Record Date Completed: 19901116

2/7/136 (Item 136 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09485791 PMID: 2398181
Chondrocyte-like colony formation of mesenchymal cells by dentin extracts in agarose gel culture.
Harada K; Oida S; Sasaki S; Enomoto S
Second Department of Oral Surgery, Tokyo Medical and Dental University, Japan.
Journal of dental research (UNITED STATES) Sep 1990, 69 (9) p1555-9, ISSN 0022-0345--Print Journal Code: 0354343
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
In this study, the effects of guanidine extracts from %%%demineralized%%% bovine dentin matrix on rat mesenchymal cells were investigated by use of an agarose gel culture. The dentin extracts were divided into water-soluble and -insoluble fractions. Rat mesenchymal cells obtained from the cultivation of skeletal muscle tissue and embedded in agarose gel were treated with these two fractions. After three weeks of cultivation, the treated cells formed colonies that were stained metachromatically with toluidine blue in a dose-dependent manner. The activity necessary to form chondrocyte-like colonies by the water-insoluble fraction was significantly higher than that by the water-soluble fraction. Each chromatographic fraction of the water-insoluble part of dentin extracts on tandem Sephacryl S-200 High-resolution columns was also investigated. Chondrocyte-like colony-forming activity was concentrated in a single fraction. However, the electrophoretic pattern of this fraction revealed that there were still some bands of molecular weight between 18 and 30 kDa. According to the Western blot analysis of this fraction, there was a band corresponding to %%%purified%%% transforming growth factor beta (TGF-beta) under the non-reducing condition. After reduction, this band disappeared and we found a band corresponding to a component of 13 kDa as well as TGF-beta. These findings suggest that TGF-beta is present not only in %%%bone%%% but also in the dentin matrix.
Record Date Created: 19901018
Record Date Completed: 19901018

2/7/137 (Item 137 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09485617 PMID: 2398077 Record Identifier: 90375554
Ectopic induction of cartilage and %%%bone%%% by water-soluble proteins from bovine %%%bone%%% using a polyanhydride delivery vehicle.
Lucas P A; Laurencin C; Syftestad G T; Domb A; Goldberg V M; Caplan A I; Langer R
Department of Surgery, Medical Center of Georgia, Mercer University School of Medicine, Macon.
Journal of biomedical materials research (UNITED STATES) Jul 1990, 24 (7) p901-11, ISSN 0021-9304--Print Journal Code: 0112726
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE, Completed
Controlled release delivery vehicles for water-soluble osteogenic proteins from %%%demineralized%%% bovine %%%bone%%% matrix were constructed using polyanhydride polymers. The water-soluble proteins were %%%isolated%%% from a 4 M guanidine hydrochloride extract of %%%bone%%% matrix. The water-soluble proteins possessed Chondrogenic Stimulating Activity (CSA) when tested in stage 24 chick limb bud cell cultures, but were incapable of inducing cartilage or %%%bone%%% in vivo when implanted intramuscularly into mice by themselves. The polyanhydride polymers alone were also incapable of inducing ectopic cartilage or %%%bone%%%. However, when the water-soluble proteins were incorporated into the polymeric delivery vehicle, the combination was capable of inducing cartilage and %%%bone%%% up to 50% of the time. These results demonstrate that it is possible to use polyanhydride polymers as controlled-release delivery vehicles for soluble bioactive factors that interact with a local cell population.
Record Date Created: 19901012
Record Date Completed: 19901012

2/7/138 (Item 138 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09484033 PMID: 2397253 Record Identifier: 90373889
Modulation of osteogenesis by %%%isolated%%% calvaria cells: a model for tissue interactions.
Villanueva J E; Nimni M E
Department of Biochemistry, School of Medicine, University of Southern California, Los Angeles.
Biomaterials (ENGLAND) Jul 1990, 11 p19-21, ISSN 0142-9612--Print Journal Code: 8100316
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE, Completed
Dispersed cells from calvaria fetuses when suspended in agarose deposit a metachromic matrix. Anchorage independence is a requirement for these cells to express type II collagen. Type I collagen is preferentially expressed by cells in monolayer cultures. Cell separation by isopycnic percoll gradient showed that cells recovered from densities 1.04 g ml-1 or higher synthesized type II collagen when suspended in agarose. These cells cultured on a plastic surface expressed type I collagen. Endothelial cells %%%isolated%%% from rat liver or bovine aorta when implanted in diffusion chambers together with dispersed calvaria cells enhanced the formation of %%%bone%%%. The calcium content was 70 times higher than in chambers containing either endothelial or calvaria cells alone. The former cells developed no %%%bone%%% at all when implanted alone, even in the presence of %%%demineralized%%% %%%bone%%% matrix, but some %%%isolated%%% islands
of cartilage could be seen.
Record Date Created: 19901016
Record Date Completed: 19901016

2/7/139 (Item 139 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09482692 PMID: 2396500 Record Identifier: 90372127
Promotion of calvarial cell osteogenesis by endothelial cells.
Villanueva J E; Nimni M E
Department of Biochemistry, School of Medicine, University of Southern California.
Journal of bone and mineral research - the official journal of the American Society for Bone and Mineral Research (UNITED STATES) Jul 1990, 5 (7) p733-9, ISSN 0884-0431--Print Journal Code: 8610640
Contract/Grant No.: AGC2577; AG; United States NIA; AR10358; AR; United States NIAMS
Publishing Model Print
Document type: In Vitro; Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
%%%Bone%%% development and remodeling are associated with changes in the pattern of vascularization. Here we show that endothelial cells %%%isolated%%% from rat liver or bovine aorta can greatly enhance %%%bone%%% formation when implanted in diffusion chambers with rat fetal calvarial cells. The latter cells are unable to form %%%bone%%% when implanted alone at low initial cell density. The amount of mineralization measured by calcium deposition was 70 times higher in chambers containing calvarial cells mixed with endothelial cells from isologous liver or bovine aorta than in chambers containing endothelial or calvarial cells alone. Alkaline phosphatase activity was increased 20-fold. Calvarial cells in the presence of %%%demineralized%%% %%%bone%%% matrix powder did not form %%%bone%%% when implanted under similar conditions. Endothelial cells implanted alone seemed to enhance neovascularization around the Millipore diffusion chambers.
Record Date Created: 19901010
Record Date Completed: 19901010

2/7/140 (Item 140 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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09444028 PMID: 2376122
Studies of compact hard tissues and collagen by means of Brillouin light scattering.
Lees S; Tao N J; Lindsay S M
Forsyth Dental Center, Boston, MA 02115.
Connective tissue research (ENGLAND) 1990, 24 (3-4) p187-205, ISSN 0300-8207--Print Journal Code: 0365263
Contract/Grant No.: 2325; United States PHS
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, Non-P.H.S.; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
A measure of the elastic properties of tissue can be found from the propagation of sound in the tissue. Longitudinal sonic velocities were measured for mineralized turkey leg tendon (density 1.50 g/cc), deer antler (1.77 g/cc) and cow tibia (2.05 g/cc) in the 10 GHz frequency regime by means of Brillouin light scattering using a nine pass Fabry-Perot interferometer. Wet, air dried, mineralized and %%%demineralized%%%

specimens were tested. Sonic velocity in each tissue increased with mineral content and decreased when the tissue was wet. All wet values are higher than for wet rat tail tendon collagen, axially and radially, but with considerably less anisotropy. The results are interpreted to indicate that %%%bone%%% matrix collagen is more highly crosslinked than tail tendon collagen. The loss of anisotropy is taken to correspond to a much higher crosslinking density between adjacent collagen molecules in mineralized tissue compared to rat tail tendon. The axial sonic velocity of dried rat tail tendon is almost that for low density dried mineralized tissue and greater than the radial sonic velocity of these tissues, but the radial sonic velocity for dried rat tail tendon is much lower, again corresponding to less crosslinking in this tissue. Longitudinal modulus, K, is defined as the tissue density times the square of the velocity. The compliance, 1/K, was found to be a linear function of density for each of the four conditions. It suggests that a Reuss formalism describes the elastic properties. Since the difference between the compliance for wet and dry tissue is also a linear function of density, the effect of water on the compliance is additive. The axial sonic velocity for cow %%%bone%%% is essentially constant over a frequency range spanning 10 orders. Presumably the axial sonic velocity is controlled by the continuity of the collagen fibers lying along the %%%bone%%% axis. The radial velocity decreases by 30% over this frequency range, probably due to the many levels of structure observed in long %%%bone%%% like osteons, Haversian canals and blood vessels, as well as internal surfaces like cement lines and between lamellae. The sonic anisotropy of hard tissues decreases considerably with increasing frequency. While rat tail tendon collagen is very anisotropic both sonically and optically, hard tissues whether wet, dry, mineralized or %%demineralized%% show much less anisotropy. The optical index of refraction, both axially and radially, was found by Brillouin scattering for the air dried %%demineralized%% tissues. A close match was found between optical and sonic anisotropy for all the %%demineralized%% tissues.
Record Date Created: 19900904
Record Date Completed: 19900904

2/7/141 (Item 141 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09436360 PMID: 2372239
Immunohistochemical localization of SPARC (osteonectin) and denatured collagen and their relationship to remodelling in rat dental tissues.
Salonen J; Domenicucci C; Goldberg H A; Sodek J
Medical Research Council Group in Periodontal Physiology, Faculty of Dentistry, University of Toronto, Ontario, Canada.
Archives of oral biology (ENGLAND) 1990, 35 (5) p337-46, ISSN 0003-9969--Print Journal Code: 0116711
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
To study this relationship, specific antibodies were used to determine the distribution of these proteins in mature rat dental tissues. Staining for SPARC with affinity-%%%purified%%% polyclonal antibodies was prominent throughout molar and incisor ligaments, endosteal tissue, dental pulp and muscle. More moderate staining was observed in other soft tissues including the lamina propria of gingiva, whereas the staining of %%%demineralized%%% %%%bone%%% was weak and in dentine was barely detectable. A monoclonal antibody (MBP 322), raised against a denatured form of a small collagenous %%%bone%%% protein, reacted strongly with osteoblastic cells but more moderately with alveolar %%%bone%%%. A strong reaction, indicative of unfolded collagen, was also evident throughout the dental pulp and molar ligament, whereas in the incisor ligament staining was largely restricted to the tooth-related half. Moderate staining with this antibody was also observed in other soft tissues and in dentine. The monoclonal antibody also stained the nuclei of certain cells; notably, whereas most of the fibroblasts in the tooth-related half of the incisor ligament were stained strongly, only occasional nuclei of fibroblasts in the molar ligament and in the %%%bone%%% -related half of the incisor ligament showed immunoreactivity. The differential staining of nuclei provides evidence for phenotypic differences between fibroblast populations within these tissues. The prominence of SPARC in the ligament tissues is consistent with their embryonic characteristics, whereas unfolded collagen recognized by the MBP 322 antibody may indicate sites of rapid collagen remodelling.
Record Date Created: 19900823
Record Date Completed: 19900823

2/7/142 (Item 142 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09422455 PMID: 2114247
%%%Purification%%% and chemical modification of porcine %%%bone%%% morphogenetic protein.
Ko L; Ma G X; Gao H L
National Laboratory of Biomacromolecules, Institute of Biophysics, Beijing, People's Republic of China.
Clinical orthopaedics and related research (UNITED STATES) Jul 1990, (256) p229-37, ISSN 0009-921X--Print Journal Code: 0075674
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Implantation of porcine %%%bone%%% morphogenetic protein (pBMP) in the muscle induces differentiation of mesenchymal-type cells and results in endochondral %%%bone%%% formation. pBMP was %%%isolated%%% from porcine %%%demineralized%%% %%%bone%%% matrix and %%%purified%%% by hydroxyapatite
chromatography, Sephadex G75 gel filtration, preparative sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE), preparative isoelectric focusing (IEF), and chromatofocusing fast protein liquid chromatography (FPLC). Porcine BMP has an MW of 26 K and a range of pI from 4.65 to 4.73 determined by SDS-PAGE and IEF, respectively. Reconstitution with the citrate buffer supernatant fraction enables as little as 50 micrograms of the soluble pBMP fractions to induce osteogenesis in an in vivo assay. Chemical modification studies indicate that the osteoinductive potential of the pBMP molecule depends on tyrosine, carboxyl groups, and disulfide bonds and can be increased by modification of sulfhydryl groups. Modification of arginine and tryptophan has no effect on bioactivity. By pepsin-limited proteolysis, fragments of pBMP with an MW of 6-14 K show definite, although reduced, BMP activity.
Record Date Created: 19900813
Record Date Completed: 19900813

2/7/143 (Item 143 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09397490 PMID: 1693566
Inhibitory effects of the %%%bone%%% -derived growth factors osteoinductive factor and transforming growth factor-beta on %%%isolated%%% osteoclasts.
Oreffo R O; Bonewald L; Kukita A; Garrett I R; Seyedin S M; Rosen D; Mundy G R
Department of Medicine, University of Texas Health Science Center, San Antonio 78284-7877.
Endocrinology (UNITED STATES) Jun 1990, 126 (6) p3069-75, ISSN 0013-7227--Print Journal Code: 0375040
Contract/Grant No.: AR-28149; AR; United States NIAMS; AR-39357; AR; United States NIAMS; DE0-856901; DE; United States NIDCR;
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM

Record type: MEDLINE; Completed

%%%Demineralized%%% %%%bone%%% matrix contains a number of growth factors for osteoblast-like cells. Two of these, the novel glycoprotein osteoinductive factor (OIF) and transforming growth factor-beta (TGF beta), act together to cause ectopic %%%bone%%% formation in vivo. Since OIF, like TGF beta, is likely released from %%%bone%%% when the matrix is resorbed, we examined the effects of homogeneous OIF and TGF beta on osteoclast function. Osteoclast function was tested in %%%isolated%%% avian osteoclasts and was measured in terms of tartrate-resistant acid phosphatase (TRAP) activity, oxygen-derived free radical production, and formation of characteristic resorption lacunae on slices of sperm whale dentine. OIF (50-100 ng/ml) inhibited the capacity of these osteoclasts to form lacunae whether assessed by the number of excavations per slice or by the total area resorbed. OIF (10-100 ng/ml) or TGF beta (10-20 ng/ml) caused a decrease in TRAP activity as well as a reduction in oxygen-derived free radical generation detected by nitroblue tetrazolium staining. TGF beta had no effect on the resorption capacity of %%%isolated%%% osteoclasts in concentrations that inhibited TRAP activity and nitroblue tetrazolium staining. These results suggest that growth regulatory factors, such as OIF and TGF beta, released during the resorption of %%%bone%%% may be endogenous inhibitors of continued osteoclastic activity. This cessation of osteoclast activity may be an essential preliminary step to the new %%%bone%%% formation that occurs at resorption sites during %%%bone%%% remodeling.

Record Date Created: 19900713

Record Date Completed: 19900713

2/7/144 (Item 144 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09250840 PMID: 2630167

A search for the osteogenic factor in dentin. Rat incisor dentin contains a factor stimulating rat muscle cells in vitro to incorporate sulfate into an altered proteoglycan.

Vela A; Sires B; Clohisy J

Northwestern University, Division of Oral Biology, Chicago, Illinois 60611.

Connective tissue research (ENGLAND) 1989, 23 (2-3) p137-44, ISSN 0300-8207--Print Journal Code: 0365263

Contract/Grant No.: DE 01734; DE; United States NIDCR; DE 08525; DE; United States NIDCR

Publishing Model Print

Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

%%%Demineralized%%% dentin matrix has the capacity to induce %%%bone%%% formation via a chondrogenic pathway when implanted into muscle, in a fashion entirely analogous to %%%bone%%% matrix implants. In this work we have attempted to %%%isolate%%%, from rat incisor dentin, the matrix factor responsible for initiating osteogenesis. Rat incisor dentin was %%%demineralized%%% with EDTA plus 4.0 M guanidine. HCl. The proteins in the extracts were collected and, after a CaCl2 precipitation step, fractionated on Sephacryl S-200 in 6.0 M guanidine. HCl. The primary assay for activity was the incorporation of 35S-sulfate into proteoglycan in cultures of the fibroblast-like outgrowth cells from explants of neonatal rat muscle. Two Sephacryl S-200 fractions showed enhanced sulfate incorporating activity, but only one showed enhanced incorporation without a concomitant increase in cell number. In the presence of this fraction, the cell cultures produced a larger amount of a new small proteoglycan, as compared to controls, and a significant amount of a much larger proteoglycan. The active fraction had proteins in the Mr range from 8,000 to 15,000 as the major components. These data suggest that the fraction identified may contain the factors responsible for initiating the osteogenic response to dentin matrix upon its implantation in muscle in vivo.

Record Date Created: 19900509

Record Date Completed: 19900509

2/7/145 (Item 145 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09219709 PMID: 2692957

Initiation of %%%bone%%% development by osteogenin and promotion by growth factors.

Reddi A H; Muthukumaran N; Ma S; Carrington J L; Luyten F P; Paralkar V M ; Cunningham N S

Bone Cell Biology Section, NIDR, Bethesda, MD.

Connective tissue research (ENGLAND) 1989, 20 (1-4) p303-12, ISSN 0300-8207--Print Journal Code: 0365263

Publishing Model Print

Document type: Journal Article; Review

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

The cellular and molecular basis of %%%bone%%% development and its regulation by differentiation and growth factors is an exciting area of current research. This article briefly reviews the historical progress in the %%%isolation%%% of osteogenin, a novel %%%bone%%% differentiation factor, and its modulation by well known growth factors. Endochondral %%%bone%%% development is a multistep sequential cascade and the process must be operationally dissected. It has been accomplished with the %%%demineralized%%% %%%bone%%% matrix-induced %%%bone%%% formation model.

The reproducible development of cartilage and %%%bone%%% in an extraskeletal site permits the study of the initiation of the first cycle of endochondral %%%bone%%% formation and mineralization. Recent progress in the %%%isolation%%% of osteogenin, a specific %%%bone%%% differentiation factor, by heparin affinity chromatography permits the further investigation of the commitment and clonal expansion of the putative osteoprogenitor stem cells. Once initiated, %%%bone%%% formation is promoted by growth factors such as platelet derived growth factor, fibroblast growth factor, insulin like growth factor, transforming growth factor beta and a plethora of non specific cytokines. Finally %%%bone%%% development is further modulated by systemic hormones and nutrition and a host of physical signals including electrical, gravitational and mechanical forces. (22 Refs.)

Record Date Created: 19900307

Record Date Completed: 19900307

2/7/146 (Item 146 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

09032405 PMID: 2742864

Characterization of the glycosphingolipids of pig cortical %%%bone%%% and cartilage.

Fukaya N; Ito M; Iwata H; Yamagata T

Laboratory of Glycoconjugate Research, Mitsubishi Kasei Institute of Life Sciences, Tokyo, Japan.

Biochimica et biophysica acta (NETHERLANDS) Jul 17 1989, 1004 (1) p108-16, ISSN 0006-3002--Print Journal Code: 0217513

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Neutral glycosphingolipids and gangliosides were extracted from pig cortical %%%bone%%% and cartilage. To ensure the completeness of extraction, the cortical %%%bone%%% was %%%demineralized%%% and reextracted. Globotriaosylceramide and globoside were noted to be present at high content in the cortical %%%bone%%%. It contained glucosylceramide, lactosylceramide, globotriaosylceramide and globoside as neutral glycosphingolipids at a ratio of 1:0.7:3.1:2.7. In articular cartilage, the ratio was 1:0.7:0.4:0.8. GM3 and GD3 were the major gangliosides in both

these tissues. GM3, GM1, GD3, GD1 and GT1 were present at ratios of 1.0:9.0:9.0:1.0:1 in the cortical %%%bone%%% and 1.0:1.2:0.06:0.02 in the cartilage. Neutral glycosphingolipids could be extracted from the cortical %%%bone%%% without the need for demineralization, while most of the gangliosides were extracted after this treatment, implying the occurrence of interactions between gangliosides and minerals in the %%%bone%%%.
Record Date Created: 19890825
Record Date Completed: 19890825

2/7/147 (Item 147 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08993367 PMID: 2722904 Record Identifier: 89255598
Ectopic induction of cartilage and %%%bone%%% by water-soluble proteins from bovine %%%bone%%% using a collagenous delivery vehicle.
Lucas P A, Syftestad G T, Goldberg V M, Caplan A I
Department of Biology, Case Western Reserve University, Cleveland, Ohio 44106.
Journal of biomedical materials research (UNITED STATES) Apr 1989, 23 (A1 Suppl) p23-39, ISSN 0021-9304--Print Journal Code: 0112726
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
A controlled-release delivery vehicle for water-soluble osteogenic proteins from %%%demineralized%%% %%%bone%%% matrix was constructed using %%%purified%%% type I collagen. The water-soluble proteins were %%%isolated%%% from a 4 M GdnHCl extract of %%%bone%%% matrix. Although the water-soluble proteins were capable of inducing cartilage formation in vitro, they were incapable of inducing cartilage or %%%bone%%% in vivo when implanted intramuscularly into mice in the absence of an appropriate delivery vehicle. The collagen-based delivery vehicle alone was also incapable of inducing osteogenesis in vivo. However, when the water-soluble proteins were incorporated into the delivery vehicle, the combination was capable of inducing cartilage and %%%bone%%% 76% of the time. These results demonstrate that it is possible to formulate a controlled-release delivery vehicles for soluble bioactive factors which upon release interact with local responsive cells.
Record Date Created: 19890710
Record Date Completed: 19890710

2/7/148 (Item 148 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08986442 PMID: 2719674 Record Identifier: 89246480
Affinity of osteogenin, an extracellular %%%bone%%% matrix associated protein initiating %%%bone%%% differentiation, for concanavalin A.
Paralkar V M; Nandedkar A K; Reddi A H
Bone Cell Biology Section, National Institute of Dental Research, Bethesda, Maryland 20892.
Biochemical and biophysical research communications (UNITED STATES) Apr 28 1989, 160 (2) p419-24, ISSN 0006-291X--Print Journal Code: 0372516
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Subcutaneous implantation of %%%demineralized%%% %%%bone%%% matrix results in %%%bone%%% differentiation. The %%%bone%%% inductive protein, osteogenin, was %%%isolated%%% recently by heparin affinity chromatography. The affinity of osteogenin for various lectins was examined to attain further %%%purification%%% and characterization. Osteogenin extracted from bovine %%%bone%%% matrix binds to concanavalin A (Con A) but not to wheat germ agglutinin or soybean lectin. The present data indicate that the %%%bone%%% inductive protein, osteogenin, is a glycoprotein. The use of a Con A Sepharose affinity column followed by preparative gel electrophoresis resulted in a greater than 250,000-fold %%%purification%%% of osteogenin.
Record Date Created: 19890616
Record Date Completed: 19890616

2/7/149 (Item 149 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08951419 PMID: 2702613
Attachment to and phagocytosis of mineral by alveolar %%%bone%%% osteoclasts.
Pierce A M
Department of Pathology, University of Adelaide, Australia.
Journal of submicroscopic cytology and pathology (ITALY) Jan 1989, 21 (1) p63-71, ISSN 1122-9497--Print Journal Code: 8804312
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The mechanisms by which the osteoclast attaches to and resorbs %%%bone%%% are not fully understood. Morphologic techniques have primarily been used to examine these mechanisms, but many studies have been based on decalcified material. In this study, the attachment of the osteoclast to alveolar %%%bone%%% and its relationship to the mineral component during the active resorption associated with tooth eruption in the rat was examined using transmission electron microscopy and techniques designed to minimize demineralization effects during processing. Large conglomerates of %%%bone%%% mineral were found within both the ruffled border and the vacuoles adjacent to this area. These deposits were clearly more extensive than the %%%isolated%%% mineral fragments described in other sites by previous investigators. Examination of %%%demineralized%%% sections showed that collagen was largely absent within the ruffled border, and not present within vacuoles. These observations suggest that phagocytosis of %%%bone%%% mineral may supplement its extracellular dissolution in situations associated with rapid %%%bone%%% turnover, such as tooth eruption. Two types of clear zone attachment to mineral were also observed, permitting further speculation on the mechanism by which osteoclasts attach to and move along the %%%bone%%% surface.
Record Date Created: 19890518
Record Date Completed: 19890518

2/7/150 (Item 150 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08950313 PMID: 2930568
Regulation of new osteoclast formation by a %%%bone%%% cell-derived macromolecular factor.
Dickson I R; Scheven B A
Department of Medicine, University of Cambridge, Addenbrooke's Hospital, UK.
Biochemical and biophysical research communications (UNITED STATES) Mar 31 1989, 159 (3) p1383-90, ISSN 0006-291X--Print Journal Code: 0372516
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Medium conditioned by incubation with embryonic chick calvarial bones, which contain osteoblasts but not osteoclasts, stimulated new osteoclast formation in foetal long %%%bone%%% cultures and in adult %%%bone%%% marrow cultures formation of tartrate-resistant acid phosphatase (TRAP) positive cells was greatly stimulated. We have termed the factor responsible for

this activity osteoclast growth/inducing factor (OGF). OGF was soluble, heat-stable and of size greater than 10kda. OGF activity was present also in mouse %%%bone%%% conditioned medium and in extracts of %%%demineralized%%% cortical diaphyseal %%%bone%%% of five-week-old chickens. OGF appeared to differ from the osteoblast-derived %%%bone%%% -resorbing factors previously observed as well as from macrophage colony stimulating factor (CSF-1). It is therefore probable that different locally secreted factors independently regulate the formation of osteoclasts and their activity.
Record Date Created: 19890511
Record Date Completed: 19890511

2/7/151 (Item 151 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08883760 PMID: 3076044 Record Identifier: 89334265
Induction and maintenance of new %%%bone%%% formation by growth and differentiation factors.
Reddi A H; Ma S S; Cunningham N S
Bone Cell Biology Section, National Institute of Dental Research, Bethesda, Md.
Annales chirurgiae et gynaecologiae (FINLAND) 1988, 77 (5-6) p189-92, ISSN 0355-9521--Print Journal Code: 7609767
Publishing Model:Print
Document type: Journal Article; Review
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
The cell biology of %%%bone%%% formation can be better understood by dissecting the complex multistep process into individual steps. It is well known that %%%demineralized%%% matrix has the potential to initiate new %%%bone%%% formation locally at a heterotopic site of implantation. The sequential development of %%%bone%%% in response to %%%bone%%% matrix is reminiscent of the cellular lineages in the epiphyseal growth plate. The developmental cascade has permitted the operational distinction of the major phases of new %%%bone%%% formation such as: migration of progenitor cells; mitosis of mesenchymal stem cells; differentiation to cartilage and %%%bone%%% ; mineralization and remodelling; and finally hematopoietic marrow differentiation. Thus the initiation of %%%bone%%% formation can be investigated as opposed to maintenance of already formed %%%bone%%% as in the orthotopic sites. Recent work has resulted in the identification and %%%isolation%%% of osteogenin, a %%%bone%%%-inductive protein. The newly formed %%%bone%%% is then maintained by a variety of polypeptide growth factors which have a regulatory role. The local action of initiation and maintenance factors is further modulated in a collaborative manner by systemic factors such as hormones and nutrition and the extracellular matrix. (27 Refs.)
Record Date Created: 19890901
Record Date Completed: 19890901

2/7/152 (Item 152 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08829204 PMID: 3224499 Record Identifier: 89136490
%%%Bone%%% induction in intramuscular implants by %%%demineralized%%% %%%bone%%% matrix: sequential changes of collagen synthesis.
Guterman I A; Boman T E; Wang G J; Balian G
Department of Orthopaedics and Rehabilitation, University of Virginia School of Medicine, Charlottesville 22908.
Collagen and related research (GERMANY, WEST) Sep 1988, 8 (5) p419-31, ISSN 0174-173X--Print Journal Code: 8102998
Contract/Grant No.: AM07462, AM; United States NIADDK; AM29766; AM; United States NIADDK
Publishing Model:Print
Document type: Journal Article; Research Support, U.S. Gov't, Non-P.H.S.; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Implantation of rat %%%demineralized%%% %%%bone%%% matrix into intramuscular pouches has been shown to cause a complex cellular transition of mesenchymal-type cells into well developed mature %%%bone%%%. %%%Demineralized%%% %%%bone%%% matrix was surgically implanted into rat muscle pouches and removed at various intervals between 7 and 28 days. Histological sections of the implants revealed %%%bone%%% formation by endochondral ossification and appositional %%%bone%%% growth. Biochemical analysis of collagen synthesis demonstrated the following. (1) synthesis of type X collagen, a collagen produced by hypertrophic chondrocytes in the growth plate and in fracture callus. (2) Synthesis of a collagenase-sensitive 17k protein which seems to increase in the early stages of %%%bone%%% induction. Pulse chase analysis indicates that 17k is not a degradation product of another protein and appears to be synthesized without a large Mr precursor. The 17k component contains one or more collagenous domains that are partially resistant to proteolysis with pepsin. Our results confirm the appearance of a cartilage intermediate during %%%demineralized%%% %%%bone%%% matrix induced ossification and implicate the existence of proteins which may be useful markers in future studies on matrix mineralization and ossification.
Record Date Created: 19890405
Record Date Completed: 19890405

2/7/153 (Item 153 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08813401 PMID: 3145959
A review of matrix-induced osteogenesis with special reference to its potential use in cranio-facial surgery.
Deatherage J R; Matukas V J; Miller E J
Department of Biochemistry, University of Alabama, School of Dentistry, Birmingham.
International journal of oral and maxillofacial surgery (DENMARK) Dec 1988, 17 (6) p395-9, ISSN 0901-5027--Print Journal Code: 8605626
Contract/Grant No.: 2 SO7 RR05300, RR; United States NCRR; DE-02670; DE; United States NIDCR
Publishing Model:Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Current data suggests that %%%purified%%% osteoinductive protein packaged into a collagenous delivery vehicle represents a viable alternative to restoring osseous defects with conventional implant materials. The proteins responsible for matrix-induced osteogenesis are the same as those that initiate and complete osseous repair of fractures. Consequently, the process of matrix-induced osteogenesis produced by implantation of the osteoinductive protein mimics the naturally occurring phenomenon of reparative osteogenesis. The collagenous delivery vehicle apparently serves the same role as the inactive collagenous %%%bone%%% matrix which is left after removal of the osteoinductive proteins from %%%demineralized%%% %%%bone%%% and, is required if osteogenesis is to occur. This collagenous delivery vehicle apparently serves a scaffold for the migration into, proliferation, and subsequent differentiation of cells responsible for osteogenesis. In addition, the original form of the collagenous implant dictates the dimensions of the resulting bony tissue. Finally, it is possible to generate an osteoinductive response in many mammals probably including man with %%%purified%%% xenogenic osteoinductive proteins. In conclusion, there is currently much research investigating the phenomenon of matrix-induced osteogenesis and its potential clinical use. In the past few years, there has been a sharp increase in the number of manuscripts published in this area of connective tissue research. Consequently, if the current trend continues, clinicians in the near future can look forward to

seeing this material being developed into a convenient "off the shelf" %%%bone%%% replacement system which stimulates host %%%bone%%% formation and repair of cranio-facial osseous defects. (31 Refs.)
Record Date Created: 19890202
Record Date Completed: 19890302

2/7/154 (Item 154 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08799959 PMID: 3208511
%%%isolation%%% partial %%%purification%%% and in vitro characterization of osteogenic inhibitory protein.
Brownell A G; Gerth N; Finerman G A
Department of Biology, Chapman College, Orange, CA 92666.
Connective tissue research (ENGLAND) 1988, 17 (4) p261-75, ISSN 0300-8207--Print Journal Code: 0365263
Contract/Grant No.: AR37440; AR; United States NIAMS
Publishing Model Print; Erratum in Connect Tissue Res 1988;18(1) following 65
Document type: In Vitro; Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
A noncollagenous protein has been extracted and partially %%%purified%%% from adult cortical %%%bone%%%. This protein copurifies with another %%%bone%%% matrix protein, %%%bone%%% morphogenetic protein, until treatment with nonionic detergents. Characterization of the biological activity of this new protein has demonstrated it to be a potent osteogenic inhibitor in vitro. The inhibitor antagonizes the chondrogenic activity of devitalized, %%%demineralized%%% %%%bone%%% matrix as well as the activity of soluble %%%bone%%% morphogenetic protein. %%%Bone%%% matrix induced collagen and glycosaminoglycan synthesis are both inhibited in the presence of various concentrations of the osteogenic inhibitory protein. Inhibition of collagen synthesis required the presence of osteogenic inhibitory protein from the initiation of the tissue culture while glycosaminoglycan synthesis could be inhibited at any stage of differentiation. We postulate that this osteogenic inhibitory protein is essential in normal homeostatic %%%bone%%% metabolism, perhaps acting directly on %%%bone%%% morphogenetic protein.
Record Date Created: 19890223
Record Date Completed: 19890223

2/7/155 (Item 155 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08797657 PMID: 3207424
Dissociative extraction and partial %%%purification%%% of osteogenin, a %%%bone%%% inductive protein, from rat tooth matrix by heparin affinity chromatography.
Katz R W; Reddi A H
Clinical Investigations and Patient Care Branch, National Institute of Dental Research, Bethesda, Md 20892.
Biochemical and biophysical research communications (UNITED STATES) Dec 30 1988, 157 (3) p1253-7, ISSN 0006-291X--Print Journal Code: 0372516
Publishing Model Print
Document type: Comparative Study; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Implantation of %%%demineralized%%% tooth matrix in subcutaneous sites results in new %%%bone%%% formation locally. The osteoinductive activity of the tooth matrix was dissociatively extracted in 4.0 M guanidine hydrochloride and the residue was devoid of biologic activity. The %%%bone%%% inductive protein, osteogenin, was partially %%%purified%%% by heparin affinity chromatography. The heparin binding fraction initiated the %%%bone%%% differentiation cascade when implanted with guanidine extracted, inactive %%%bone%%% or tooth matrices. These results imply a cooperative interaction between the soluble osteogenin and collagenous substratum in %%%bone%%% induction.
Record Date Created: 19890203
Record Date Completed: 19890203

2/7/156 (Item 156 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08785527 PMID: 3200834
%%%Purification%%% and characterization of other distinct %%%bone%%% -inducing factors.
Wang E A; Rosen V; Cordes P; Hewick R M; Kriz M J; Luxenberg D P; Sibley B S; Wozney J M
Department of Tissue Growth and Repair, Genetics Institute, Cambridge, MA 02140.
Proceedings of the National Academy of Sciences of the United States of America (UNITED STATES) Dec 1988, 85 (24) p9484-8, ISSN 0027-8424--Print Journal Code: 7505876
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
We %%%purified%%% a factor that induces %%%bone%%% formation greater than 300,000-fold from guanidinium chloride extracts of %%%demineralized%%% %%%bone%%%. Fifty nanograms of highly %%%purified%%% protein was active in an in vivo cartilage and %%%bone%%%-formation assay. The activity resided in a single gel band, corresponding to a molecular mass of approximately 30 kDa, which yielded proteins of 30, 18, and 16 kDa on reduction. The partial amino acid sequence obtained from these proteins confirmed our identification of specific factors that induce new %%%bone%%% formation in vivo.
Record Date Created: 19890126
Record Date Completed: 19890126

2/7/157 (Item 157 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08587780 PMID: 3357082 Record Identifier: 88187893
Osteogenesis in rats with an inductive bovine composite.
Nathan R M; Bentz H; Armstrong R M; Piez K A; Smestad T L; Ellingsworth L R; McPherson J M; Seyedin S M
Connective Tissue Research Laboratories, Collagen Corporation, Palo Alto, California 94303.
Journal of orthopaedic research : official publication of the Orthopaedic Research Society (UNITED STATES) 1988, 6 (3) p324-34, ISSN 0736-0266 --Print Journal Code: 8404726
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Subcutaneous (S.C.) implantation of allogeneic %%%demineralized%%% %%%bone%%% matrix in rats results in endochondral %%%bone%%% formation. In contrast, implants of bovine %%%demineralized%%% %%%bone%%% matrix in rat S.C. tissue show inconsistent cartilage and %%%bone%%% formation, presumably due to an intense inflammatory reaction at the implant site. To overcome this response, a partially %%%purified%%% %%%bone%%% inducing extract was prepared from bovine %%%bone%%% by a series of steps that included demineralization, guanidine/HCl extraction, gel filtration, and cation exchange chromatography. To develop a carrier, the inactive guanidine/HCl-extracted matrix was then trypsinized to remove the inflammatory and immunogenic components, thus yielding a predominantly

collagenous matrix. Bovine composites were prepared by combining different amounts of the %%%bone%%% inducing extract with a carrier that consisted of the trypsinized %%%bone%%% matrix and %%%purified%%% soluble bovine dermal collagen. Subcutaneous implantation of the composite preparation resulted in dose-dependent endochondral %%%bone%%% formation in rats. The inductive activity and the low-level inflammatory response were comparable to allogeneic implants.
Record Date Created: 19880513
Record Date Completed: 19880513

2/7/158 (Item 158 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08498118 PMID: 3443788 Record Identifier: 88171072
%%%[Purification%%% and properties of a growth factor from human %%%bone%%% matrix]
Tsutsumi S
Department of Orthopedic Surgery, School of Medicine, Hokkaido University, Japan.
Nippon Seikeigeka Gakkai zasshi (JAPAN) Nov 1987, 61 (11) p1285-92, ISSN 0021-5325--Print Journal Code: 0413716
Publishing Model Print
Document type: English Abstract; Journal Article
Languages: JAPANESE
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
A growth factor was %%%isolated%%% from %%%demineralized%%% human %%%bone%%%-matrix and %%%purified%%% approximately 2,300-fold with 5.6% yield by the procedures of acetone treatment, Blue-A matrix gel chromatography, Sephadex G-75 gel filtration and Mono-Q fast protein liquid chromatography. The final preparation was homogeneous and a single polypeptide of 18,000 daltons as judged by SDS-polyacrylamide gel electrophoresis. The %%%purified%%% growth factor stimulated DNA synthesis in embryonic chick osteoblast in a dose-dependent manner and was saturated at the concentration of 4 ng/ml. By comparing various properties of the final preparation with those of other growth factors derived from %%%bone%%% , it appears to be a novel growth factor, and may be one of the important local regulators of %%%bone%%% remodeling.
Record Date Created: 19880512
Record Date Completed: 19880512

2/7/159 (Item 159 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08442651 PMID: 3479965 Record Identifier: 88076956
%%%Bone%%%-derived and recombinant transforming growth factor beta's are potent inhibitors of tumor cell growth.
Ranchalis J E; Gentry L; Ogawa Y; Seyedin S M; McPherson J; Purchio A; Twardzik D R
Oncogen, Seattle, WA 98121.
Biochemical and biophysical research communications (UNITED STATES) Oct 29 1987, 148 (2) p783-9, ISSN 0006-291X--Print Journal Code: 0372516
Publishing Model Print
Document type: Comparative Study; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Two naturally occurring chrondogenesis inducing peptides have been %%%purified%%% to homogeneity from %%%demineralized%%% bovine %%%bone%%%.
Cartilage-inducing factors A and B are the %%%bone%%%-derived equivalents of transforming growth factor-beta types I and II. Both peptides exhibit identical biological activities in chondrogenesis assays and stimulate anchorage independent cell growth. In this study we show that both %%%bone%%% -derived factors are potent (ng/ml) inhibitors of both DNA synthesis and the anchorage independent growth of a variety of human and non-human tumor cells. Unique in this study is also a comparison of the activities of these polypeptide growth factors with recombinant transforming growth factor type I expressed in mammalian cells.
Record Date Created: 19871221
Record Date Completed: 19871221

2/7/160 (Item 160 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08408099 PMID: 3478684 Record Identifier: 88041057
%%%Isolation%%% of osteogenin, an extracellular matrix-associated, %%%bone%%%-inductive protein, by heparin affinity chromatography.
Sampath T K; Muthukumaran N; Reddi A H
Bone Cell Biology Section, National Institute of Dental Research, Bethesda, MD 20892.
Proceedings of the National Academy of Sciences of the United States of America (UNITED STATES) Oct 1987, 84 (20) p7109-13, ISSN 0027-8424--Print Journal Code: 7505876
Publishing Model Print
Document type: Comparative Study; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Implantation of %%%demineralized%%% diaphyseal %%%bone%%% matrix in subcutaneous sites induces a sequence of events resulting in the local differentiation of endochondral %%%bone%%%. %%%Demineralized%%% bovine %%%bone%%% matrix was dissociatively extracted in 4.0 M guanidine hydrochloride and the %%%bone%%%-inductive proteins were %%%purified%%% greater than 12,000-fold. The %%%purification%%% steps include affinity chromatography on heparin-Sepharose, hydroxyapatite chromatography, gel filtration, and C18 reverse-phase HPLC. Since the %%%purified%%% protein in conjunction with insoluble collagenous %%%bone%%% matrix induced new %%%bone%%% differentiation in vivo we have designated this component osteogenin. The osteogenic potential is specific for osteogenin and is not exhibited by previously %%%isolated%%% growth factors.
Record Date Created: 19871125
Record Date Completed: 19871125

2/7/161 (Item 161 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08371876 PMID: 3652662 Record Identifier: 88003361
Packaging and delivery of %%%bone%%% induction factors in a collagenous implant.
Deatherage J R; Miller E J
School of Dentistry, University of Alabama at Birmingham 35294.
Collagen and related research (GERMANY, WEST) Aug 1987, 7 (3) p225-31, ISSN 0174-173X--Print Journal Code: 8102996
Contract/Grant No.: DE-02670; DE; United States NIDCR
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Extracts of %%%demineralized%%% rat bones which contained factors stimulating %%%bone%%% induction were reconstituted with highly %%%purified%%% human type I collagen to provide a suitable and easily manipulated delivery system for surgical implantation. When implanted subcutaneously in rats, the implants governed and delineated the dimensions of the resulting bony tissue. It is proposed that this implant system has clinical application in the filling of osseous defects within the scope of

orthopaedic and oral and maxillofacial surgery. It is presented here as a potential improvement over conventional implant materials without osteoinductive properties.
Record Date Created: 19871120
Record Date Completed: 19871120

2/7/162 (Item 162 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08323821 PMID: 3610670
Simultaneous demonstration of %%%bone%%% alkaline and acid phosphatase activities in plastic-embedded sections and differential inhibition of the activities.
Liu C; Sanghvi R; Burnell J M; Howard G A
Histochemistry (GERMANY, WEST) 1987, 86 (6) p559-65, ISSN 0301-5564--Print Journal Code: 0411300
Contract/Grant No.: DE 02600; DE; United States NIDCR; RR05346-23; RR; United States NCRR
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, Non-P.H.S.; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
%%%Bone%%% alkaline (AlP) and acid phosphatase (AcP) activities were simultaneously demonstrated in tissue sections obtained from mice, rats, and humans. The method involved tissue fixation in ethanol, embedding in glycol methacrylate (GMA), and demonstration of AlP and AcP activities employing a simultaneous coupling azo dye technique using substituted naphthol phosphate as a substrate. AlP activity was demonstrated first followed by AcP activity. Both enzyme activities were demonstrated in tissue sections from bones fixed and/or stored in acetone or 70% ethanol for up to 14 days or stored in GMA for 2 months. AlP activity in tissue sections from bones fixed in 10% formalin, 2% glutaraldehyde, or formal-calcium, however, was markedly inhibited after 3-7 days and was no longer detectable after 14 days of fixation. Moreover, AlP activity was diminished in tissue sections from bones fixed in 70% ethanol or 10% formalin and subsequently %%%demineralized%%% in 10% EDTA (pH 7) for 2 days, and the activity was completely abolished in tissue sections from bones subsequently %%%demineralized%%% in 5% formic acid: 20% sodium citrate (1:1, pH 4.2) for 2 days. Methyl methacrylate (MMA) embedding at concentrations above 66% completely inhibited AlP activity. AcP activity, however, was only partially inhibited by formalin, glutaraldehyde, or formal-calcium after 7 or 14 days of fixation or by MMA embedding and was unaffected by the demineralizing agent formic acid-citrate for 2 days. While AcP activity was preserved in bones fixed in formalin and subsequently %%%demineralized%%% in EDTA, the activity was completely abolished when EDTA demineralization was carried out on bones previously fixed in 70% ethanol.(ABSTRACT TRUNCATED AT 250 WORDS)
Record Date Created: 19870828
Record Date Completed: 19870828

2/7/163 (Item 163 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08239631 PMID: 3298485
Nature of %%%bone%%% morphogenetic protein (BMP) from decalcified rabbit %%%bone%%% matrix.
Takahashi S; Iwata H; Hanamura H
Nippon Seikeigeka Gakkai zasshi (JAPAN) Feb 1987, 61 (2) p197-204, ISSN 0021-5325--Print Journal Code: 0413716
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE, Completed
Rabbit %%%bone%%% morphogenetic protein (BMP) from %%%demineralized%%% and defatted rabbit %%%bone%%% matrix was partially %%%purified%%%. BMP activity was examined by the implantation of fractionated materials into the thigh muscle pouch of the mouse. Rabbit BMP was solubilized by both 4M guanidine hydrochloride (GuHCl) and 6M urea solutions. Crude BMP had isoelectric point precipitation at pH 3 in 6M urea and showed %%%bone%%% morphogenesis. Fractions eluted with 0 and 0.2 N NaCl in DEAE CL-6B ion exchange chromatography showed %%%bone%%% morphogenesis in each individual pH of pH 4 to pH 7 but the fraction eluted with 1.0 N NaCl did not show any activity. Sephadex G-75 filtration separated the crude material into three peaks and the peak of about 23,000 showed %%%bone%%% morphogenesis. In sodium dodecyl sulfate (SDS) polyacrylamide gel electrophoresis and isoelectric focusing, rabbit BMP was thought to be an acidic protein having a molecular weight of 24,000 with an isoelectric point around 4.85.
Record Date Created: 19870724
Record Date Completed: 19870724

2/7/164 (Item 164 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08292876 PMID: 3594998
Effect of %%%bone%%% marrow mononuclear phagocytes on the %%%bone%%% matrix-induced %%%bone%%% formation in rats.
Sakata H; Takagi K
Clinical orthopaedics and related research (UNITED STATES) Jul 1987, (220) p253-8, ISSN 0009-921X--Print Journal Code: 0075674
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Experimental ulnar %%%bone%%% defects in rats were grafted with freshly %%%isolated%%% whole %%%bone%%% marrow cells; %%%bone%%% marrow mononuclear phagocytes (macrophages); or both types of marrow cell preparations in combination with %%%demineralized%%% %%%bone%%% matrix gelatin (BMG). In the absence of BMG, the osteogenic performance of the marrow cell preparations was superior to that of the macrophages. In the presence of BMG (composite grafts), their osteogenic potential was nearly identical and significantly improved the level of %%%bone%%% formation stimulated by implants of BMG alone. The results encourage speculation and further research on sequential activities of %%%bone%%% marrow monocyte-macrophage (osteoclast) lineages and marrow stromal (osteoprogenitor) cell in %%%bone%%% morphogenetic protein (BMP)-induced regeneration.
Record Date Created: 19870807
Record Date Completed: 19870807

2/7/165 (Item 165 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08234818 PMID: 3561974
Biologic principles of %%%bone%%% induction.
Reddi A H; Wientroub S; Muthukumaran N
Orthopedic clinics of North America (UNITED STATES) Apr 1987, 18 (2) p207-12, ISSN 0030-5898--Print Journal Code: 0254463
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
This article provides a concise review of %%%bone%%% induction. %%%Bone%%% induction by %%%demineralized%%% %%%bone%%% matrix is a multistep cascade. The %%%purification%%% and elucidation of the chemistry of osteogens will improve %%%bone%%% grafting methods.
Record Date Created: 19870427
Record Date Completed: 19870427

2/7/166 (Item 166 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08110194 PMID: 3098387
Chemotaxis of muscle-derived mesenchymal cells to %%%bone%%%-inductive proteins of rat.
Landesman R. Reddi A H
Calcified tissue international (GERMANY, WEST) Oct 1986, 39 (4) p259-62, ISSN 0171-967X--Print Journal Code: 7905481
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
In this investigation we examined the chemotaxis of muscle-derived mesenchymal cells from neonatal rats to partially %%%purified%%% extracts of %%%demineralized%%% %%%bone%%% matrix with osteoinductive properties. Using the modified Boyden chamber assay and muscle-derived mesenchymal cells obtained from neonatal Long-Evans rats, we tested the chemotactic properties of the 4 M guanidine-HCl extract from %%%demineralized%%% rat %%%bone%%% matrix and fractions thereof that were derived from sequential Sepharose CL-6B, TSK-3000 and HPLC-C18 chromatography. We have identified that those fractions exhibiting chemotactic properties were also osteoinductive. Therefore, %%%demineralized%%% %%%bone%%% matrix serves as its own soluble signal and insoluble substratum in the inductive process leading to endochondral %%%bone%%% formation in vivo.
Record Date Created: 19870213
Record Date Completed: 19870213

2/7/167 (Item 167 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

08109050 PMID: 3790376 Record Identifier: 87076217
Partial %%%isolation%%% and characterization of a chemotactic factor from adult bovine %%%bone%%% for mesenchymal cells.
Lucas P A; Syftestad G T; Caplan A I
Bone (UNITED STATES) 1986, 7 (5) p365-71, ISSN 8756-3282--Print Journal Code: 8504048
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
%%%Demineralized%%% adult %%%bone%%% matrix has the capacity to initiate de novo ectopic endochondral %%%bone%%% formation 2-3 weeks following intramuscular implantation into suitable hosts. An early step in this process is the migration of mesenchymal cells to the implant site; these cells later differentiate into cartilage and %%%bone%%%. Adult %%%bone%%% has been shown to contain a number of bioactive factors, such as chemotactic factors for various cell types, including osteoblasts. We have used embryonic chick limb bud mesenchymal cells to construct an in vitro assay for testing chemotactic activity derived from %%%bone%%% matrix extracts. With a modified Boyden chamber, water-soluble components from a 4 M guanidinium chloride extract of %%%demineralized%%% adult bovine %%%bone%%% matrix were found to stimulate the directional migration of these chick embryonic limb bud mesenchymal cells as well as embryonic muscle-derived fibroblasts and cells derived from embryonic skin. The chemotactic activity was destroyed by treatment with heat (100 degrees C) or trypsin. Partial %%%purification%%% by molecular sieve chromatography suggested that the chemotactic factor(s) has a molecular weight of between 50,000 and 90,000. This factor can be separated from %%%bone%%% matrix-derived chondrogenic stimulating activity by either ion exchange or molecular sieve chromatography. These observations confirm that %%%bone%%% matrix contains a chemoattractant for mesenchymal cells that may be important for in vivo recruitment of cells as part of the process of ectopic %%%bone%%% formation or in cases of %%%bone%%% repair.
Record Date Created: 19870127
Record Date Completed: 19870127

2/7/168 (Item 168 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07983069 PMID: 3728562
Lethal osteogenesis imperfecta with amniotic band lesions: collagen studies.
van der Rest M; Hayes A; Marie P; Desbarats M. Kaplan P; Glorieux F H
American journal of medical genetics (UNITED STATES) Jul 1986, 24 (3) p433-46, ISSN 0148-7299--Print Journal Code: 7708900
Publishing Model Print
Document type: Case Reports; Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
An infant was born with osteogenesis imperfecta (OI) and died after 7 days. In addition, there were amniotic constriction bands and amputations of several digits of the upper and lower limbs. The radiologic picture was suggestive of type III OI. Histomorphometric analysis of the %%%bone%%% showed a trabecular %%%bone%%% volume of 15.1% compared to 26.9% for age-matched controls. This was due to a decreased apposition of matrix by the osteoblasts. Because abnormal collagen synthesis has been suggested as the underlying defect in most forms of OI, collagen studies were undertaken using intact tissues. %%%Bone%%% and skin collagen solubilities were strikingly reduced. Shortened type I collagen molecules, representing 25% of the total type I collagen, were produced by pepsin digestion of the %%%demineralized%%% %%%bone%%% matrix. The molecular weight of the shortened collagen, was 10 kd lower than normal for both the alpha 1 and alpha 2 chains as determined by gel electrophoresis. The %%%bone%%% acetic acid-soluble collagen showed few shortened alpha-chains. Twenty-five percent of the acid-soluble %%%bone%%% collagen was cleaved into shortened molecules by a pepsin digestion. The shortened alpha 1 chain was %%%purified%%% by high-performance liquid chromatography (HPLC) and digested with CNBr. The analysis of the resulting fragments by HPLC and by gel electrophoresis unequivocally demonstrated that the shortened alpha 1 chain was derived from the alpha 1(I) chains and that the pepsin sensitivity extends from the amino-terminal end of the chain to the alpha 1(I) CB5 peptide, approximately 120 residues inside the triple helix. These studies show a distinct structural abnormality of type I collagen in the %%%bone%%% matrix of this patient resulting in an increased sensitivity of the collagen to general enzymatic proteolysis. The importance of correlating clinical and biochemical information in OI is emphasized; classification and genetic counseling based only on clinical observations are inaccurate.
Record Date Created: 19860812
Record Date Completed: 19860812

2/7/169 (Item 169 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07936320 PMID: 3707140 Record Identifier: 86214079
Biosynthesis and fate of proteoglycans in cartilage and %%%bone%%% during development and mineralization.
Tian M Y; Yanagishita M; Hascall V C; Reddi A H
Archives of biochemistry and biophysics (UNITED STATES) May 15 1986, 247 (1) p221-32, ISSN 0003-9861--Print Journal Code: 0372430
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA

Record type: MEDLINE; Completed

Subcutaneous implantation of %%%demineralized%%% %%%bone%%% matrix in rats induces migration of host cells into the site and results in the sequential development of cartilage and %%%bone%%%. The biosynthesis and metabolic fate of proteoglycans in the plaques at the %%%bone%%% matrix implantation site were investigated by [35S]sulfate labeling in vivo. 35S-Labeled proteoglycans were extracted with 4 M guanidine HCl and %%%purified%%% by DEAE-Sephacel chromatography. Analysis of proteoglycans on Sepharose CL-2B chromatography showed two major peaks at Kd = 0.28 and 0.68 (peaks I and II, respectively). Peak I proteoglycan has a high buoyant density and contains chondroitin sulfate chains of average Mr = 20,000. Peak II proteoglycan has a lower average buoyant density and contains dermatan sulfate chains of average Mr = 33,000. Throughout the endochondral %%%bone%%% development sequence, peak II proteoglycan predominates. Peak I was low on Day 3, became prominent on Day 7 (approximately 30% of the total radioactivity), and declined after Day 9. The calculated half-lives of peak I and II proteoglycans labeled on Day 7 were about 1.8 and 2.8 days, respectively. After the initiation of osteogenesis, a species of mineral-associated proteoglycan was extracted with a 4 M guanidine HCl solvent containing 0.5 M EDTA. This proteoglycan has a small hydrodynamic size (Kd = 0.38 on Sepharose CL-6B chromatography) and shows a long half-life, about 6 days.

Record Date Created: 19860606

Record Date Completed: 19860606

2/7/170 (Item 170 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07921102 PMID: 3754555

Cartilage-inducing factor-A. Apparent identity to transforming growth factor-beta.

Seyedin S M; Thompson A Y; Bentz H; Rosen D M; McPherson J M; Conti A; Siegel N R; Galluppi G R; Piez K A

Journal of biological chemistry (UNITED STATES) May 5 1986, 261 (13) p5693-5. ISSN 0021-9258--Print Journal Code: 2985121R

Publishing Model Print

Document type: Comparative Study; Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Comparison of the sequence of the N-terminal 30 amino acids of cartilage-inducing factor-A (CIF-A) from bovine %%%demineralized%%% %%%bone%%% with the corresponding sequence of human transforming growth factor-beta (TGF-beta) revealed 100% identity. Furthermore, CIF-A stimulated normal rat kidney fibroblasts to become anchorage-independent and form colonies in soft agar (in the presence of epidermal growth factor) in a manner similar to TGF-beta. Similarly, TGF-beta from human platelets induced rat muscle mesenchymal cells to differentiate and synthesize cartilage-specific macromolecules in a manner equivalent to CIF-A. These data show that CIF-A and TGF-beta are closely related or identical molecules and that these factors may be involved in cell differentiation including cartilage formation as the first step in endochondral %%%bone%%% formation.

Record Date Created: 19860530

Record Date Completed: 19860530

2/7/171 (Item 171 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07913744 PMID: 3083831

Carboxyglutamic acid (Gla) containing proteins of human calcified atherosclerotic plaque solubilized by EDTA. Molecular weight distribution and relationship to osteocalcin.

Levy R J; Howard S L; Oshry L J

Atherosclerosis (NETHERLANDS) Feb 1986, 59 (2) p155-60, ISSN 0021-9150--Print Journal Code: 0242543

Contract/Grant No.: HL-20764; HL; United States NHLBI; HL-24463; HL; United States NHLBI

Publishing Model Print

Document type: Comparative Study; Journal Article; Research Support, U.S. Gov't, P.H.S.

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Proteins containing the calcium binding amino acid, gamma-carboxyglutamic acid (Gla), are abundant in calcified human atherosclerotic plaque, but are detectable only at trace levels in the normal arterial wall and non-mineralized atherosclerotic lesions. These proteins have been incompletely characterized, and their role in the pathophysiology of atherosclerosis is not known. The present study sought to determine the overall molecular weight distribution of the calcified plaque Gla-protein fraction solubilized by EDTA demineralization and the possible relationship of these proteins to the %%%bone%%% Gla-protein, osteocalcin. Calcified atheromata were %%%demineralized%%% with EDTA (0.5 M, pH 6.9) for 7 days and the dialyzed EDTA extract subjected to procedures which specifically labeled the protein-bound Gla-residues with tritium. The EDTA solubilized Gla-protein fraction (19.5% of the total Gla) was separated by gel filtration high performance liquid chromatography which demonstrated a single broad radiolabeled Gla-protein peak with an approximate molecular weight of 6000 daltons. In addition the EDTA solubilized atherosclerotic Gla-proteins could be distinguished from the %%%bone%%% Gla-protein, osteocalcin (molecular weight = 5700 daltons), by reverse phase HPLC and specific radioimmunoassays for osteocalcin. It is concluded that the Gla-proteins of human calcified atherosclerotic plaque solubilized with EDTA demineralization consist of a heterogeneous 6000 dalton fraction, which is apparently unrelated to the %%%bone%%% Gla-protein, osteocalcin.

Record Date Created: 19860515

Record Date Completed: 19860515

2/7/172 (Item 172 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07787114 PMID: 4076642 Record Identifier: 86082878

The in vitro chondrogenic response of limb-bud mesenchyme to a water-soluble fraction prepared from %%%demineralized%%% %%%bone%%% matrix.

Syftestad G T; Lucas P A; Caplan A I

Differentiation; research in biological diversity (GERMANY, WEST) 1985 , 29 (3) p230-7, ISSN 0301-4681--Print Journal Code: 0401680

Publishing Model Print

Document type: In Vitro; Journal Article; Research Support, U.S. Gov't, P.H.S.

Languages: ENGLISH

Main Citation Owner: NLM

Other Citation Owner: NASA

Record type: MEDLINE; Completed

%%%Demineralized%%% adult %%%bone%%% matrix initiates de novo ectopic endochondral ossification 2-3 weeks following its intramuscular implantation into adult animals. This phenomenon appears to be similar, in some ways, to inductive cell-matrix interactions which regulate cartilage and %%%bone%%% formation during development. In the present study, we used embryonic chick limb-bud mesenchymal-cell cultures to bioassay extracts of %%%demineralized%%% %%%bone%%% matrix for chondrogenic activity. Guanidinium-chloride (4 M) extracts of %%%demineralized%%% bovine %%%bone%%% were dialyzed against buffers of decreasing ionic strength and then cold water. The cold-water-soluble fraction was found to stimulate chondrogenesis in intermediate-density limb-bud cell cultures (2.2 X 10(6) cells per 35-mm dish), as revealed by visual inspection with phase optics, toluidine-blue staining of fixed plates, and [35S] sulfate incorporation in the cell layer. Further fractionation of this material by anion-exchange, carbohydrate-affinity, and molecular-sieve chromotography produced a semipurified preparation possessing chondrogenic-stimulating activity at doses ranging from 3 to 10 micrograms/ml. The in vitro chondrogenic response of limb-bud mesenchymal cells was dose-dependent, required a minimal initial plating density of 2.08 X 10(5) cells/mm2 of culture dish,

and developed gradually over 8-10 days. At an optimal dose of extract, a continuous exposure period of at least 2-3 days was necessary to produce detectable chondrogenic stimulation. In addition, the amount of cartilage formed following an 8-day exposure was markedly influenced by the culture 'age' of the mesenchymal cells (i.e., the time between plating and the start of treatment).(ABSTRACT TRUNCATED AT 250 WORDS)
Record Date Created: 19860124
Record Date Completed: 19860124

2/7/173 (Item 173 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07761064 PMID: 3905107
%%%Bone%%% matrix-induced local %%%bone%%% induction.
Muthukumaran N; Reddi A H
Clinical orthopaedics and related research (UNITED STATES) Nov 1985, (200) p159-64, ISSN 0009-921X--Print Journal Code: 0075674
Publishing Model Print
Document type: Journal Article; Review
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The sequential cellular changes in the implants in response to collagenous %%%bone%%% matrix-induced local %%%bone%%% formation include binding of fibronectin to matrix, chemotaxis and attachment of progenitor cells, proliferation and differentiation of progenitor cells into chondrocytes, and finally osteogenesis and marrow differentiation. The cellular origin of osteogenic proteins is not clear. The present study compares the osteogenic potential of %%%demineralized%%% rat and porcine %%%bone%%% matrix by dissociative extraction and reconstitution. Judging from the Sephacryl S-200 gel filtration profiles of the dissociative extracts of rat and porcine matrix, the latter appears to be smaller. Under identical experimental conditions, the rat chondrosarcoma and osteosarcoma were examined for chondrogenic and osteogenic properties and found to be devoid of inductive potential. It is noteworthy that gel filtration fractions of rat chondrosarcoma on Sepharose CL-6B are inhibitory to %%%bone%%% inductive potential of %%%demineralized%%% rat %%%bone%%% matrix. (36 Refs.)
Record Date Created: 19860116
Record Date Completed: 19860116

2/7/174 (Item 174 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07750439 PMID: 4059251
%%%Demineralized%%% %%%bone%%% matrix is a powerful source of the protein which programs mesodermal differentiation.
Hopenskaya O; Zaitseva L; Bogdanov M; Stolbovskaya O
Progress in clinical and biological research (UNITED STATES) 1985, 187 p97-107, ISSN 0361-7742--Print Journal Code: 7605701
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Record Date Created: 19851127
Record Date Completed: 19851127

2/7/175 (Item 175 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07709772 PMID: 4038302 Record Identifier: 85306979
Comparison of %%%bone%%% inductive proteins of rat and porcine %%%bone%%% matrix.
Muthukumaran N; Sampath T K; Reddi A H
Biochemical and biophysical research communications (UNITED STATES) Aug 30 1985, 131 (1) p37-41, ISSN 0006-291X--Print Journal Code: 0372516
Publishing Model Print
Document type: Comparative Study; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Subcutaneous implantation of %%%demineralized%%% %%%bone%%% matrix in allogenic rats induces a sequence of events resulting in de novo formation of cartilage, %%%bone%%% and %%%bone%%% marrow. In the present study endochondral %%%bone%%% formation by %%%demineralized%%% porcine matrix was studied and compared with the rat %%%bone%%% matrix. Endochondral %%%bone%%% formation was induced by 4M guanidine hydrochloride fraction IV (less than 50,000 daltons) of Sepharose CL-6B gel filtration but not by whole extract or by %%%demineralized%%% porcine %%%bone%%% matrix. Sephacryl S-200 gel filtration of the osteoinductive proteins of fraction IV showed the Porcine osteoinductive factor to be associated with protein fraction III (less than 20,000 daltons) whereas the rat with fraction II (between 20,000 and 30,000 daltons) of the chromatographic profile indicating an apparent difference in molecular weight of the osteoinductive factors between these two species.
Record Date Created: 19851017
Record Date Completed: 19851017

2/7/176 (Item 176 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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07687845 PMID: 4028562
Effect of partially %%%purified%%% %%%bone%%% morphogenetic protein on DNA synthesis and cell replication in calvarial and fibroblast cultures.
Canalis E; Centrella M; Urist M R
Clinical orthopaedics and related research (UNITED STATES) Sep 1985, (198) p289-96, ISSN 0009-921X--Print Journal Code: 0075674
Contract/Grant No.: AM21707; AM; United States NIADDK; DE02103; DE; United States NIDCR
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The effects of %%%bone%%% morphogenetic protein (BMP), a molecule extracted from %%%demineralized%%% %%%bone%%%, were observed in organ cultures of 21-day fetal rat calvariae. The effects of BMP on cell replication in cultures of normal rat kidney (NRK) fibroblasts were studied for comparison. At concentrations of 0.1-10 micrograms/ml for periods of 24-96 hours, BMP stimulated the incorporation of 3H-thymidine into acid-insoluble residues (DNA) in calvariae by 25%-159%, and at 1-10 micrograms/ml it increased %%%bone%%% DNA content by 20%-23%. BMP at 1 micrograms/ml also increased the number of calvarial mitoses after colcemid arrest by 1.5-1.8-fold. The effect of BMP on calvarial DNA synthesis was observed in the periosteal %%%bone%%%. In contrast to its effects on DNA synthesis, BMP did not stimulate the incorporation of 3H-proline into collagenase-digestible and noncollagen protein and did not alter calvarial alkaline phosphatase activity. BMP at 1-10 micrograms/ml caused a marked increase in 3H-thymidine incorporation into DNA in cultured NRK fibroblasts and increased DNA content and cell number by 1.5-2-fold. These studies indicate that BMP stimulates DNA synthesis and cell replication in calvarial and fibroblast cultures but does not stimulate postdifferentiated %%%bone%%% cells in incubated calvariae.
Record Date Created: 19851007
Record Date Completed: 19851007

2/7/177 (Item 177 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07636249 PMID: 2988716
Calcium-acidic phospholipid-phosphate complexes in human atherosclerotic aortas.
Dmitrovsky E, Boskey A L
Calcified tissue international (GERMANY, WEST) Mar 1985, 37 (2) p121-5, ISSN 0171-967X--Print Journal Code: 7905481
Contract/Grant No.: DE04141, DE; United States NIDCR
Publishing Model Print
Document type: Comparative Study; Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Since aortic calcification chemically resembles %%%bone%%% mineralization, we tested the hypothesis that a %%%bone%%% mineral nucleator, the Ca-acidic phospholipid-phosphate complexes, is found in atherosclerotic plaques. Calcium-acidic phospholipid-phosphate complexes were %%%isolated%%% from hydroxyapatite-containing calcified plaques and from adjacent nonmineralized areas of adult human aortas. Neonatal aortas, which served as nonmineralized lesion-free controls, contained negligible amounts of the Ca-acidic phospholipid-phosphate complexes. The concentration of complexed acidic phospholipids in the aortic plaques (5 micrograms/mg %%%demineralized%%% dry wt) was comparable to that found in newly mineralized %%%bone%%% and calcified cartilage. The presence of Ca-acidic phospholipid-phosphate complexes in the nonmineralized regions of the adult aorta, as well as in the mineralized plaques, suggests that this tissue may calcify through mechanisms similar to those involved in %%%bone%%% mineralization.
Record Date Created: 19850820
Record Date Completed: 19850820

2/7/178 (Item 178 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07619221 PMID: 3889139
Specific immunohistochemical localization of osteonectin and collagen types I and III in fetal and adult porcine dental tissues.
Tung P S, Domenicucci C, Wasi S, Sodek J
Journal of histochemistry and cytochemistry : official journal of the Histochemistry Society (UNITED STATES) Jun 1985, 33 (6) p531-40, ISSN 0022-1554--Print Journal Code: 9815334
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Affinity-%%%purified%%% antibodies have been used in combination with the peroxidase-antiperoxidase technique to study the distribution of osteonectin and collagen types I and III in porcine dental tissues. Tissue sections (2 mm thick), including unerupted (fetal) or erupted (adult) teeth, were fixed in periodate-lysine-paraformaldehyde, %%%demineralized%%% in 12% w/v ethylenediaminetetraacetic acid, and after embedding, 6 micron sections were prepared for immunolocalization. Strong staining for osteonectin was observed in dentine of unerupted teeth and in the associated alveolar %%%bone%%%. Light to moderate staining was observed in the dental pulp, stratum intermedium, stellate reticulum, and the reticular elements in the endosteal spaces. In erupted teeth, osteonectin staining in dentine was concentrated around dentinal tubules and the associated alveolar %%%bone%%% stained with variable intensity. Cementum was poorly stained. However, the periodontal ligament and reticular material in the endosteal spaces showed moderate to strong staining. Weaker staining was apparent in the pulp and lamina propria of the gingiva. In comparison, type I collagen showed a similar distribution to osteonectin in both fetal and adult tissues, whereas type III collagen was generally restricted to the periodontal ligament, reticular elements of the endosteal spaces, and Sharpey's fibers in %%%bone%%% and cementum. Both odontoblast and ameloblast layers in fetal tissues stained for osteonectin and type III collagen.
Record Date Created: 19850709
Record Date Completed: 19850709

2/7/179 (Item 179 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07603782 PMID: 3857579 Record Identifier: 85190478
%%%Purification%%% and characterization of two cartilage-inducing factors from bovine %%%demineralized%%% %%%bone%%%.
Seyedin S M, Thomas T C, Thompson A Y, Rosen D M, Piez K A
Proceedings of the National Academy of Sciences of the United States of America (UNITED STATES) Apr 1985, 82 (8) p2267-71, ISSN 0027-8424--Print Journal Code: 7505876
Publishing Model Print
Document type: Comparative Study; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Two naturally occurring peptides that induce chondrogenesis in culture have been %%%purified%%% to apparent homogeneity. These cartilage-inducing factors (CIF-A and CIF-B) were %%%isolated%%% from bovine %%%demineralized%%% %%%bone%%% by dissociative extraction, gel filtration, cation-exchange chromatography, and reversed-phase HPLC. CIF-A and CIF-B at concentrations of 1-10 ng/ml each induce embryonic rat mesenchymal cells in culture to assume a cartilage morphology and synthesize cartilage-specific proteoglycan and type II collagen. The amino acid compositions of CIF-A and CIF-B are similar but not identical. Both factors have an apparent Mr of 26,000, as determined by NaDodSO4/PAGE. In the presence of 2-mercaptoethanol, both are converted to species of about one-half that Mr, indicating that they are dimers of identical or very similar chains.
Record Date Created: 19850603
Record Date Completed: 19850603

2/7/180 (Item 180 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07576099 PMID: 3979446
Chondrogenesis in agarose gel culture. A model for chondrogenic induction, proliferation and differentiation.
Thompson A Y, Piez K A, Seyedin S M
Experimental cell research (UNITED STATES) Apr 1985, 157 (2) p483-94, ISSN 0014-4827--Print Journal Code: 0373226
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
An in vitro model has been developed to study chondrogenic induction, proliferation and differentiation. Embryonic rat mesenchymal cells %%%isolated%%% from muscle and embedded in agarose were treated with a partially %%%purified%%% extract from bovine %%%demineralized%%% %%%bone%%% powder. Treated cells proliferated and synthesized matrix similar to differentiated chondrogenic cells in a dose-dependent manner. By employing an enzyme-linked immunosorbent assay (ELISA), cartilage-specific proteoglycan and type II collagen synthesis were quantitated. Of the cells tested, only embryonic mesenchymal cells from muscle responded to %%%bone%%% extract. Proteoglycan synthesis was sensitive to type of medium and cell density.
Record Date Created: 19850523
Record Date Completed: 19850523

2/7/181 (Item 181 from file: 155)

DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07501449 PMID: 6098191
The resorption of biological and non-biological substrates by cultured avian and mammalian osteoclasts.
Jones S J; Boyde A; Ali N N
Anatomy and embryology (GERMANY, WEST) 1984, 170 (3) p247-56, ISSN 0340-2061--Print Journal Code: 7505194
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Mammalian and avian osteoclasts were %%%isolated%%% mechanically from long bones, seeded on to either untreated, unmineralized, anorganic or surface-%%%demineralized%%% mammalian dental tissues, and cultured for 1-6 h or up to 9 days in medium with added serum (10% heat-inactivated FCS). All substrates showed Howship's resorption lacunae which varied in detail with the composition and structural organization of the tissue. There was no species or substrate specificity. Osteoclasts also adhered, spread, migrated and resorbed in the absence of serum. In addition, osteoclasts resorbed avian egg shell and mollusc shell containing calcite and aragonite. When given the opportunity, osteoclasts are thus biochemically competent to resorb a much wider range of substrates than they usually do in vivo. Access to the substrate and attraction or deliverance of osteoclast precursors to it must be curtailing factors in in vivo resorption.
Record Date Created: 19850311
Record Date Completed: 19850311

2/7/182 (Item 182 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07467735 PMID: 6508782 Record Identifier: 85072143
Extracellular matrix proteins involved in %%%bone%%% induction are vitamin D dependent.
Sampath T K; Wientroub S; Reddi A H
Biochemical and biophysical research communications (UNITED STATES) Nov 14 1984, 124 (3) p829-35, ISSN 0006-291X--Print Journal Code: 0372516
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Subcutaneous implantation of %%%demineralized%%% diaphyseal %%%bone%%% matrix into allogeneic rats results in local formation of cartilage and %%%bone%%%. However, implantation of %%%demineralized%%% %%%bone%%% matrix obtained from rachitic rats did not induce %%%bone%%%. Rachitic %%%bone%%% matrix was therefore dissociatively extracted with 4 M guanidine HCl and then reconstituted with an inactive collagenous residue of control as carrier. Such reconstituted materials also lacked %%%bone%%% inductive potential. On the other hand, reconstitution of guanidine HCl extracts of control %%%bone%%% matrix with inactive vitamin D deficient matrix did result in %%%bone%%% induction. Partial %%%purification%%% (fractions containing proteins (less than 50,000 daltons) of the guanidine HCl extract from rachitic rats on Sepharose CL-6B followed by reconstitution with inactive collagenous residues resulted in a weak (25% of control) inductive response. These observations imply that %%%bone%%% inductive proteins are vitamin D dependent and are reduced in matrix obtained from rachitic rats.
Record Date Created: 19850102
Record Date Completed: 19850102

2/7/183 (Item 183 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07451880 PMID: 6501437
Effect of substrate composition on %%%bone%%% resorption by rabbit osteoclasts.
Chambers T J; Thomson B M; Fuller K
Journal of cell science (ENGLAND) Aug 1984, 70 p61-71, ISSN 0021-9533--Print Journal Code: 0052457
Publishing Model Print
Document type: In Vitro; Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Slices of human femoral cortical %%%bone%%% were prepared with a carborundum wheel. Osteoclasts were %%%isolated%%% from neonatal rabbit long bones and incubated on either untreated, %%%demineralized%%% or anorganic preparations of these %%%bone%%% slices. Anorganic %%%bone%%% showed extensive tracts of uninterrupted surface excavation after incubation, while untreated %%%bone%%% tended to show discontinuous excavations of smaller total volume; %%%demineralized%%% %%%bone%%% was not resorbed. The endosteal surface of adult rat calvaria was also used as a substrate for osteoclastic %%%bone%%% resorption. The endosteal surface was exposed and rendered acellular, and was used either without further treatment or after incubation in collagenase. %%%Bone%%% resorption occurred only in those calvaria pre-treated with collagenase. These experiments imply that osteoclastic contact with %%%bone%%% mineral rather than the endosteal surface is the stimulus that initiates %%%bone%%% -resorptive behaviour in osteoclasts. The mechanism by which osteoblasts induce osteoclastic %%%bone%%% resorption may be through the known ability of osteoblasts to secrete collagenase, which, by digestion of the unmineralized lamina limitans of endosteal surfaces, exposes %%%bone%%% mineral to osteoclastic contact.
Record Date Created: 19850118
Record Date Completed: 19850118

2/7/184 (Item 184 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07356690 PMID: 6745488 Record Identifier: 84262190
A fraction from extracts of %%%demineralized%%% adult %%%bone%%% stimulates the conversion of mesenchymal cells into chondrocytes.
Syftestad G T; Caplan A I
Developmental biology (UNITED STATES) Aug 1984, 104 (2) p348-56, ISSN 0012-1606--Print Journal Code: 0372762
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
%%%Demineralized%%% adult %%%bone%%% contains factors which stimulate nonskeletal mesenchymal cells to undergo a developmental progression resulting in de novo endochondral ossification. In this study, %%%isolated%%% embryonic stage 24 chick limb bud mesenchymal cells maintained in culture were utilized as an in vitro assay system for detection of specific bioactive components solubilized from adult chicken %%%bone%%% matrix. Guanidinium chloride extracts (4 M) of %%%demineralized%%%-defatted %%%bone%%% were fractionated and tested in limb mesenchymal cell cultures for possible effects upon growth and chondrogenesis. Two low-molecular-weight fractions were found to be active in these cultures. A cold water-insoluble, but warm Tris-buffered saline-soluble fraction provoked a dose-dependent increase in the amount of cartilage formed after 7 days of continuous exposure as evidenced by an increased number of chondrocytes observed in living cultures, elevated cell-layer-associated 35S incorporation per microgram DNA, and greater numbers of toluidine blue-staining foci (i.e., cartilage nodules). Growth

inhibitory substances were detected in a low-molecular-weight, water-soluble fraction. 7 days of continuous exposure to this material resulted in less cartilage formation and reduced cell numbers (accumulated DNA) on each plate. These observations demonstrate the usefulness of stage 24 chick limb bud cell cultures for identifying bioactive factors extracted from adult %%%bone%%% matrix. In addition, the action of these factors on mesenchymal cells may now be studied in a cell culture system.
Record Date Created: 19840907
Record Date Completed: 19840907

2/7/185 (Item 185 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07353386 PMID: 6430514
%%%Bone%%%-derived factors active on %%%bone%%% cells.
Mohan S; Linkhart T; Farley J; Baylink D
Calcified tissue international (GERMANY, WEST) 1984, 36 Suppl 1 pS139-45. ISSN 0171-967X--Print Journal Code: 7905481
Contract/Grant No.: AM 31061; AM; United States NIADDK; AM 31062; AM; United States NIADDK
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, Non-P.H.S.; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Effects of systemic calcium regulating hormones have been studied extensively, yet mechanisms of %%%bone%%% volume regulation at the local level are poorly understood. Our laboratory has reported evidence for two locally mediated processes of %%%bone%%% volume regulation which function independently of systemic control: (1) coupling of %%%bone%%% formation and resorption and (2) repletion of resorbed %%%bone%%%. These local regulatory mechanisms have been shown to occur in vivo and in vitro. We have reported that embryonic chick tibiae in culture, stimulated to resorb, release a factor in the serum-free culture medium that stimulates %%%bone%%% cell proliferation and %%%bone%%% matrix formation in vitro. We have postulated that this factor could be involved in the coupling mechanism. Subsequently, a similar factor which stimulates %%%bone%%% cell proliferation, collagen synthesis and %%%bone%%% formation in vitro was extracted from embryonic and adult bones. The factor partially %%%purified%%% from human %%%bone%%%, designated as human skeletal growth factor, has molecular weight, heat sensitivity and biological activity similar to the factor found in %%%bone%%% conditioned medium. Many other biologically active factors have also been extracted from %%%bone%%% cells or %%%demineralized%%% %%%bone%%% by different laboratories. Their actions on %%%bone%%% cells range from chemotactic to mitogenic. These recently discovered %%%bone%%% factors emphasize that there is important regulation of %%%bone%%% metabolism at the local level.
Record Date Created: 19840918
Record Date Completed: 19840918

2/7/186 (Item 186 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07320420 PMID: 6587359 Record Identifier: 84221970
In vitro transformation of mesenchymal cells derived from embryonic muscle into cartilage in response to extracellular matrix components of %%%bone%%%.
Sampath T K; Nathanson M A; Reddi A H
Proceedings of the National Academy of Sciences of the United States of America (UNITED STATES) Jun 1984, 81 (11) p3419-23, ISSN 0027-8424--Print Journal Code: 7505876
Contract/Grant No.: AM-01040; AM; United States NIADDK; AM-28240; AM; United States NIADDK
Publishing Model Print
Document type: Journal Article; Research Support. U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Subcutaneous implantation of %%%demineralized%%% diaphyseal %%%bone%%% matrix into rats induces cartilage and %%%bone%%% formation in vivo. When minced skeletal muscle is cultured on hemicylinders of %%%demineralized%%% %%%bone%%% in vitro, mesenchymal cells are transformed into chondrocytes. In the present investigation, the potential of extracellular matrix components of %%%bone%%% to trigger cartilage differentiation in vitro was examined. Extraction of %%%bone%%% hemicylinders with 6 M guanidine X HCl resulted in the absence of chondrogenesis in vitro and endochondral %%%bone%%% formation in vivo. Biologically inactive hemicylinders of %%%bone%%% were then reconstituted with the guanidine extract and also with partially %%%purified%%% components extracted from %%%bone%%% matrix and bioassayed. Reconstitution completely restored the ability to elicit chondrogenesis in vitro and endochondral %%%bone%%% differentiation in vivo. Reconstitution of the whole guanidine extract on Millipore filters coated with gels of tendon collagen (type I) and subsequent culture with minced skeletal muscle also resulted in cartilage induction in vitro. These observations show that the extracellular matrix of %%%bone%%% is a repository of factors that govern local cartilage and %%%bone%%% differentiation.
Record Date Created: 19840724
Record Date Completed: 19840724

2/7/187 (Item 187 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07284167 PMID: 6712678
Distribution of %%%bone%%% inductive proteins in mineralized and %%%demineralized%%% extracellular matrix.
Sampath T K; Reddi A H
Biochemical and biophysical research communications (UNITED STATES) Mar 30 1984, 119 (3) p949-54, ISSN 0006-291X--Print Journal Code: 0372516
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Implantation of %%%demineralized%%% extracellular %%%bone%%% matrix results in new %%%bone%%% formation locally. Although the precise molecular mechanisms are not known, the reconstitution of matrix proteins less than 50,000 daltons with collagenous residue results in %%%bone%%% induction. The aim of the present investigation was to ascertain the distribution of the %%%bone%%% inductive protein(s) in various compartments of the tissue. A sequential extraction of mineralized %%%bone%%% matrix was employed: (1) 4 M guanidine HCl to extract proteins that are cell associated and not masked by mineral; (2) 0.5 M EDTA to dissolve the mineral phase; (3) 4 M guanidine HCl to reextract the collagenous matrix-associated proteins under dissociative conditions; (4) 4 M guanidine HCl containing 0.5 M EDTA to release any other residual proteins. This sequential method revealed that about 25% of total biological activity of %%%bone%%% induction is associated with first guanidine extraction, about 15% with the mineral phase and the rest of the activity is tightly associated with the collagenous matrix.
Record Date Created: 19840511
Record Date Completed: 19840511

2/7/188 (Item 188 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07196358 PMID: 6607731 Record Identifier: 84127992
Matrix Gla protein, a new gamma-carboxyglutamic acid-containing protein

which is associated with the organic matrix of %%%bone%%%.
Price P A; Urist M R; Otawara Y
Biochemical and biophysical research communications (UNITED STATES) Dec 28 1983, 117 (3) p765-71, ISSN 0006-291X--Print Journal Code: 0372516
Contract/Grant No.: AM25921; AM; United States NIADDK; AM27029; AM; United States NIADDK, DE02103; DE; United States NIDCR
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
A new protein has been %%%isolated%%% from CaCl2/urea extracts of %%%demineralized%%% bovine %%%bone%%% matrix. This protein has five to six residues of the vitamin K-dependent amino acid, gamma-carboxyglutamic acid (Gla), and we have accordingly designated it matrix Gla protein. Matrix Gla protein is a 15,000 dalton protein whose amino acid composition includes a single disulfide bond. The absence of 4-hydroxyproline in matrix Gla protein demonstrates that it is not a precursor to %%%bone%%% Gla protein, a 5,800 dalton protein which has a residue of 4-hydroxyproline at position 9 in its sequence. Matrix Gla protein also does not cross-react with antibodies raised against %%%bone%%% Gla protein.
Record Date Created: 19840305
Record Date Completed: 19840305

2/7/189 (Item 189 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07129119 PMID: 6579546
Homology of %%%bone%%%-inductive proteins from human, monkey, bovine, and rat extracellular matrix.
Sampath T K; Reddi A H
Proceedings of the National Academy of Sciences of the United States of America (UNITED STATES) Nov 1983, 80 (21) p6591-5, ISSN 0027-8424--Print Journal Code: 7505876
Publishing Model Print
Document type: Comparative Study; Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Allogeneic implantation of rat extracellular %%%demineralized%%% diaphyseal %%%bone%%% matrix in subcutaneous sites induces a sequence of events resulting in the local differentiation of endochondral %%%bone%%%. However, xenogenic subcutaneous implantation of human, monkey, and bovine extracellular %%%bone%%% matrix into rat showed that bovine matrix had only a weak capacity to induce %%%bone%%%, whereas human and monkey matrix had none at all. This suggested that extracellular matrix-induced %%%bone%%% differentiation is apparently species-specific. We recently reported that the extraction of matrix with 4 M guanidine X HCl resulted in complete removal of the ability to induce endochondral %%%bone%%% differentiation, with the biological activity of the matrix being again restored when the extracted active matrix components (less than 50,000 daltons) were reconstituted with the inactive residue. To define the possible biochemical basis of species specificity, human, monkey, and bovine extracellular %%%bone%%% matrices were extracted with 4 M guanidine X HCl and the extracts were reconstituted with biologically inactive rat residue and bioassayed. The results were similar to those obtained with intact matrices and showed that total extracts of bovine matrix had a weak capacity to induce %%%bone%%% , whereas corresponding extracts of human and monkey matrix did not induce %%%bone%%%. However, partial %%%purification%%% by gel filtration of 4 M guanidine X HCl extracts from each species followed by reconstitution of the different fractions with inactive rat residue resulted in %%%bone%%% induction by all species from fractions containing proteins of less than 50,000 daltons. These observations demonstrate that species specificity of xenogenic extracellular %%%bone%%% matrix is due to immunogenic or inhibitory components (or both) in the guanidine X HCl residue and solubilized extracellular matrix components of greater than 50,000 daltons. These results imply that there is homology in the %%%bone%%% inductive proteins from human, monkey, bovine, and rat extracellular %%%bone%%% matrices.
Record Date Created: 19831217
Record Date Completed: 19831217

2/7/190 (Item 190 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07089952 PMID: 6616317 Record Identifier: 84001625
Identification of a %%%bone%%% matrix-derived chemotactic factor.
Somerman M; Hewitt A T; Varner H H; Schiffmann E; Termine J; Reddi A H
Calcified tissue international (GERMANY, WEST) Jul 1983, 35 (4-5) p481-5, ISSN 0171-967X--Print Journal Code: 7905481
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
When %%%demineralized%%% %%%bone%%% matrix powder is implanted subcutaneously in the rat, the early responses involve the appearance and proliferation of mesenchymal cells at the site of implantation, followed by cartilage and %%%bone%%% formation. The ability of cells to migrate to the implant suggests that chemotaxis may be a critical event in this process. Therefore, using the modified Boyden chamber assay, we tested extracts of %%%demineralized%%% %%%bone%%% matrix for chemotactic activity. We have identified and partially %%%purified%%%, on molecular sieve chromatography, a heat labile and trypsin-sensitive protein (Mr = 60,000-70,000) that is a potent chemoattractant for mouse calvaria, osteoblast-like cells (MMB-1), but not for monocytes (putative osteoclast precursors). These findings suggest that chemotactic protein(s) have a significant role in the recruitment of osteoprogenitor cells to a site of %%%bone%%% repair.
Record Date Created: 19831123
Record Date Completed: 19831123

2/7/191 (Item 191 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

07033021 PMID: 6866999
Human %%%bone%%% morphogenetic protein (hBMP).
Urist M R; Sato K; Brownell A G; Malinin T I; Lietze A; Huo Y K; Prolo D J; Oklund S; Finerman G A; DeLange R J
Proceedings of the Society for Experimental Biology and Medicine. Society for Experimental Biology and Medicine (New York, N.Y.) (UNITED STATES) Jun 1983, 173 (2) p194-9, ISSN 0037-9727--Print Journal Code: 7505892
Contract/Grant No.: DE02103; DE; United States NIDCR
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Human %%%bone%%% morphogenetic protein (hBMP) was chemically extracted from %%%demineralized%%% gelatinized cortical %%%bone%%% matrix by means of a CaCl2 X urea inorganic-organic solvent mixture, differential precipitation in guanidine hydrochloride, and preparative gel electrophoresis. hBMP is %%%isolated%%% in quantities of 1 mg/kg of wet weight of fresh %%%bone%%%, and has the amino-acid composition of an acidic polypeptide. The mol wt is 17 to 18 k-Da (kilodaltons). Implants of the %%%isolated%%% 17-kDa protein are very rapidly adsorbed and produce a smaller volume of %%%bone%%% than protein fractions consisting of 24-, 17-, and 14-kDa proteins. Since the %%%isolated%%% 24- and 14-kDA components lack hBMP activity, the kinetics of the %%%bone%%% morphogenetic processes including the function of other proteins as carrier molecules, await investigation.

Record Date Created: 19830811
Record Date Completed: 19830811

2/7/192 (Item 192 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

06948125 PMID: 6825959
Analysis of cartilage differentiation from skeletal muscle grown on %%%bone%%% matrix. III. Environmental regulation of glycosaminoglycan and proteoglycan synthesis.
Nathanson M A
Developmental biology (UNITED STATES) Mar 1983, 96 (1) p46-62, ISSN 0012-1606--Print Journal Code: 0372762
Contract/Grant No.: HD-00143; HD; United States NICHD; RR-05393; RR; United States NCRR
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
The ability of numerous nutritional and topographic factors to influence differentiation of embryonic mesenchyme has given rise to several theories which attempt to explain the development of muscle and cartilage from these similar-appearing cells. Some theories are challenged by the observation that a substratum of %%%demineralized%%% %%%bone%%% is capable of supporting the transformation of skeletal muscle into cartilage in vitro and that the potential to form cartilage still resides within cloned myoblasts and fibroblasts of skeletal muscle. In the present study, culture media CMRL-1066, minimal essential medium (MEM), and F-12 provide varied nutritional environments and are tested for their ability to support the morphological and biochemical transformation of skeletal muscle into cartilage. Morphologically, CMRL-1066 reproducibly supports hyaline cartilage formation, whereas MEM does so in only one out of three explants onto %%%demineralized%%% %%%bone%%%, and F-12 is incapable of supporting formation of a hyaline matrix. Biochemically, each medium is sufficient to elicit synthesis of cartilage-like patterns of sulfated glycosaminoglycans and proteoglycan monomer. Synthesis of hyaluronic acid (HA) initially increases in explants grown in CMRL-1066, but decreases prior to chondrogenesis. MEM elicits a similar increase in HA synthesis, but the subsequent decrease is not as rapid. In F-12, synthesis remains depressed throughout the experiment. The data show that increases in HA synthesis occur concurrent with the appearance of fibroblast-like cells, which normally precede chondroblasts. Decreases in HA synthesis correlate well with the onset of chondrogenesis. Explants grown in CMRL-1066 reproducibly from cartilage and synthesize the greatest amounts of proteoglycan aggregate. Those grown in MEM form cartilage infrequently, synthesize reduced amounts of proteoglycan aggregate-like material, and contain greater amounts of HA, of low molecular weight. The data demonstrate that chondrogenesis can be subtly regulated by environmental factors, and such factors regulate both the morphological and biochemical expression of the phenotype through HA synthesis.
Record Date Created: 19830421
Record Date Completed: 19830421

2/7/193 (Item 193 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

06829385 PMID: 7140074
The nature of %%%bone%%% morphogenetic protein (BMP) fractions derived from bovine %%%bone%%% matrix gelatin.
Mizutani H; Urist M R
Clinical orthopaedics and related research (UNITED STATES) Nov-Dec 1982, (171) p213-23, ISSN 0009-921X--Print Journal Code: 0075674
Contract/Grant No.: DE02103, DE; United States NIDCR
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
A %%%bone%%% morphogenetic protein (BMP) fraction consisting of 17.5K, as well as three other low MW components, was extracted from %%%demineralized%%% bovine %%%bone%%% matrix gelatin under dissociative conditions in 4 M GuHCl. This BMP fraction induces differentiation of mesenchymal cells into cartilage and %%%bone%%% when implanted in the thigh muscles of mice. The 17.5K component is a prime candidate for BMP, but the relationship to the 34K, 24K, and 14K components is not established completely. The 24K component is of special interest, because, when it is present in combination with 17.5K and other components, the resultant preparation has high biologic activity. The 24K component, when %%%isolated%%% from the 17.5K component, had no BMP activity. The 14K component, when %%%isolated%%% from the 17.5K component and all components, had no BMP activity. A 22K components completely %%%isolated%%% by CMC chromatography had no BMP activity. The tasks ahead are to examine further the conditions controlling aggregation of the four low MW glycoproteins and to determine whether it is possible to %%%isolate%%% a single 17.5K homogeneous polypeptide with BMP activity.
Record Date Created: 19830127
Record Date Completed: 19830127

2/7/194 (Item 194 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

06825579 PMID: 6814400 Record Identifier: 83047638
Osteoinduction. Part II: %%%Purification%%% of the osteoinductive activities of %%%bone%%% matrix.
Thielemann F W; Schmidt K; Koslowski L
Archives of orthopaedic and traumatic surgery. Archiv fur orthopadische und Unfall-Chirurgie (GERMANY, WEST) 1982, 100 (2) p73-8, ISSN 0344-6484--Print Journal Code: 7803037
Publishing Model Print
Document type: Journal Article; Research Support, Non-U.S. Gov't
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Using a previously described experimental model for demonstration of osteoinduction biological activity of variably prepared fractions of %%%demineralized%%% %%%bone%%% matrix was studied. Sequential extraction of matrix using CaCl2, EDTA, LiCl and water results in an acceleration of the induction process and a reduction of immunological host reaction in the case of xenogenic implants. Application of chaotropic reagents such as guanidinium chloride and sodium thiocyanate has the consequency of lowering the inductive signal. From these results it is likely that noncollagenous constituents of %%%bone%%% matrix play a significant role in osteoinduction.
Record Date Created: 19821218
Record Date Completed: 19821218

2/7/195 (Item 195 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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06780139 PMID: 6288076 Record Identifier: 83000277
%%%Purification%%% of a skeletal growth factor from human %%%bone%%%.
Farley J R; Baylink D J
Biochemistry (UNITED STATES) Jul 6 1982, 21 (14) p3502-07, ISSN 0006-2960--Print Journal Code: 0370623
Contract/Grant No.: AM 27195; AM; United States NIADDK, DE 02600, DE; United States NIDCR
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, Non-P.H.S.; Research Support, U.S. Gov't, P.H.S.

Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
A skeletal growth factor was %%%isolated%%% and %%%purified%%% from %%%demineralized%%% human %%%bone%%% matrix. A dose of 6 micrograms/mL of the %%%purified%%% factor significantly increased the proliferation rate of embryonic chick %%%bone%%% cells in serum-free culture (292% of controls, p less than 0.0001) but had no effect on embryonic chick skin cells plated at the same initial density. The factor is sensitive to inactivation by trypsin and urea, but not by collagenase. 20% butanol, or 1% mercaptoethanol. It is also resistant to inactivation by heat (stable for 15 min at 75 degrees C) and extremes of pH (stable for 30 min at 4 degrees C from pH 2.5 to 10.0). %%%Purification%%% of the active factor by selective heat and acid precipitations, molecular sieve column chromatography, and preparative polyacrylamide gel electrophoresis provided a material that was homogeneous by the criteria of high-pressure liquid chromatography, polyacrylamide gel electrophoresis, and isoelectric focusing. The apparent molecular weight is 83 000. The %%%purified%%% factor increases %%%bone%%% cell proliferation at doses comparable to other mitogens: 0.3 microgram/mL (3.6 nM) significantly increases DNA synthesis to 231% of controls (p less than 0.001). The %%%purified%%% factor was also active on cultured embryonic chick bones, enhancing the growth rate of tibiae and femurs, as measured by increased dry weight (185% of controls, p less than 0.025) and [3H]proline incorporation (164% of control, p less than 0.001), respectively.
Record Date Created: 19821202
Record Date Completed: 19821202

2/7/196 (Item 196 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

06159886 PMID: 6929747 Record Identifier: 80200559
Solubilized %%%bone%%% morphogenetic protein (BMP) from mouse osteosarcoma and rat %%%demineralized%%% %%%bone%%% matrix.
Hanamura H; Higuchi Y; Nakagawa M; Iwata H; Nogami H; Urist M R
Clinical orthopaedics and related research (UNITED STATES) May 1980, (148) p281-90, ISSN 0009-921X--Print Journal Code: 0075674
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
A selection of proteins including %%%bone%%% morphogenetic protein (BMP) was extracted in a disaggregated form from Dunn osteosarcoma or rat %%%demineralized%%% %%%bone%%% matrix by 4M guanidine hydrochloride (GuHCl) solution without losing its biological activity. The GuHCl extracts of Dunn osteosarcoma were divied into 4 different fractions by cesium chloride (CsCl) density gradients. Under a dissociative condition, the highest new %%%bone%%% yield was obtained in the low dense top one-third fraction, and BMP activity declined with increase in the density of each fraction. No BMP potential was observed in the surface-gel fraction under dissociative conditions. Under an associative condition (low GuHCl concentrations), BMP activity appears in the surface-gel fraction, while under a dissociative condition (high concentrations of GuHCl) BMP appears in the fraction below the surface gel. These facts suggest that under associative conditions, BMP aggregates with other low dense proteins in the surface-gel fraction and that this may be the state of aggregation of BMP in cells and matrix in nature. Present observations support the assumption that BMP is a relatively low density protein and excludes the idea of BMP activity in the collagen molecule, per se. A specific protein, with an apparent molecular weight of 63,000 daltons, is present in all fractions that exhibit BMP activity, and absent in fractions that do not exhibit this activity. BMP is not species-specific; rat BMP induces %%%bone%%% formation in mice. CsCl density-gradient centrifugation is an efficient tool for further %%%purification%%% and %%%isolation%%% of BMP.
Record Date Created: 19800828
Record Date Completed: 19800828

2/7/197 (Item 197 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

06006749 PMID: 116738 Record Identifier: 80066764
Detection of collagen degradation products from subcutaneously implanted organic %%%bone%%% matrix.
Takagi Y; Kuboki Y; Sasaki S
Calcified tissue international (UNITED STATES) Nov 6 1979, 28 (3) p253-8, ISSN 0171-967X--Print Journal Code: 7905481
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
%%%Demineralized%%% bovine %%%bone%%% powder was reduced with NaB3H4 to label the collagen crosslinks with tritium. The powder was enclosed in small nylon mesh pouches and implanted subcutaneously into rats for 3 weeks. Histological examinations revealed that multinuclear giant cells accumulated around the %%%bone%%% matrix, some in Howship's lacunae. Collagenous peptides containing intermolecular crosslinks were detected in the urea-soluble fraction extracted from the implant. Two crosslink-containing peptides were %%%isolated%%% from a dialyzable fraction: one contained dihydroxylysinonorleucine and the other hydroxylysinonorleucine. Both peptides had molecular weights of approximately 1000 estimated from the elution positions of gel filtration chromatography, and both had similar quantitative compositions of amino acids. There were no homologous peptides detected in a control experiment of the reduced %%%bone%%% matrix which was incubated in vitro with buffered saline for 1 week at 37 degrees C.
Record Date Created: 19800226
Record Date Completed: 19800226

2/7/198 (Item 198 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

05898422 PMID: 221908 Record Identifier: 79201695
Solubilized and insolubilized %%%bone%%% morphogenetic protein.
Urist M R; Mikulski A; Lietze A
Proceedings of the National Academy of Sciences of the United States of America (UNITED STATES) Apr 1979, 76 (4) p1828-32, ISSN 0027-8424--Print Journal Code: 7505876
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
A %%%bone%%% morphogenetic protein (BMP) obtained in solution by digestion of %%%demineralized%%% rabbit cortical %%%bone%%% matrix with bacterial collagenase retains its biologically active conformation in a neutral salt/ethylene glycol mixture. BMP may be insolubilized by coprecipitation with calcium phosphate and resolubilized by chemical extraction with a neutral salt in the same solvent mixture. Upon concanavalin A-Sepharose chromatography, BMP is bound by hydrophobic interaction and carbohydrate recognition and is recovered by elution with either alpha-methyl mannoside or ethylene glycol solvent mixture. Implants of both eluates and the extracts of the coprecipitate in double-walled diffusion chambers induce transmembrane %%%bone%%% morphogenesis. BMP is not species specific; rabbit BMP induces new %%%bone%%% formation in the rat. The present observations indicate that BMP is a glycoprotein.
Record Date Created: 19790816
Record Date Completed: 19790816

2/7/199 (Item 199 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

05332051 PMID: 321100 Record Identifier: 77136008
On the state of anionic groups of %%%demineralized%%% matrices of %%%bone%%% and dentine.
Li S T, Katz E P
Calcified tissue research (GERMANY, WEST) Feb 11 1977, 22 (3) p275-84, ISSN 0008-0594--Print Journal Code: 0114414
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Calcium-binding and biochemical studies have been applied to characterize the state of the carboxylate and protein-bound phosphate groups in the EDTA-%%%demineralized%%% matrices of rat %%%bone%%% and dentine. The organic phosphate and carboxylate content of %%%demineralized%%% %%%bone%%% is virtually identical to that of %%%purified%%% steer skin collagen whereas %%%demineralized%%% dentine has a significantly higher phosphate and carboxylate content, presumably due to the presence of an acidic non-collagenous phosphoprotein. Two classes of calcium-binding sites can be detected in %%%demineralized%%% %%%bone%%%, %%%demineralized%%% dentine,
and %%%purified%%% , reconstituted collagen. The number of strong calcium-binding sites correlates with the number of protein-bound phosphate groups. Depending on the preparative procedure, seven to nine such sites (per collagen molecule) are present in dentine, and one to two in the %%%purified%%% reconstituted collagen and in %%%bone%%% . The binding constant for the dentinal sites (1.1 X 10(4) M-1), however, is 20 times greater than that for %%%bone%%% or reconstituted collagen fibrils from skin. We tentatively conclude that the strong calcium-binding site in %%%bone%%% and reconstituted collagen is of the form protein-PO-4Ca whereas in dentine it is of the form protein (formula: see text); the weak binding sites in %%%bone%%% and dentine are of the form protein-COO-Ca; and that approximately 160 of the 217 carboxylate groups of the collagen molecules of dentine or %%%bone%%% are present as electrostatic linkages of the form protein-COO- protein.
Record Date Created: 19770520
Record Date Completed: 19770520

2/7/200 (Item 200 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2008 Dialog. All rts. reserv.

05329562 PMID: 190900 Record Identifier: 77132023
A %%%bone%%% matrix calcification-initiator noncollagenous protein.
Uriel M R, Mikulski A J, Nakagawa M, Yen K
American journal of physiology (UNITED STATES) Mar 1977, 232 (3) pC115-27, ISSN 0002-9513--Print Journal Code: 0370511
Publishing Model Print
Document type: Journal Article; Research Support, U.S. Gov't, P.H.S.
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
When completely %%%demineralized%%%, the densely packed structure of %%%bone%%% matrix does not recalcify, neither in physiologic solutions in vitro nor in implants in vivo. Even when inorganic and organic calcification inhibitors (which normally are stored in %%%bone%%% matrix) are removed first by autolytic digestion in neutral buffers at 37C and then by sequential chemical extraction, implants of the EDTA insoluble residue will not recalcify after as long as 4 wk in a muscle pouch. However, if first %%%demineralized%%% in cold dilute HCl, second, extracted and autodigested in buffers solution at 37C, and then further extracted in EDTA and other solutions at 2C, a calcification initiator protein (Cp) is unmasked, and the residue will invariable recalcify. CIP, %%%isolated%%% by gel filtration and column chromatography, is a disulfide-bonded glycoprotein aggregate composed of subunites of a molecular mass of 55,000. CIP is composed of a large proportion of acidic amino acids and has a calcium binding capacity of about 1.8 times greater than albumin. The affinity constant CaCIP, calculated by ultrafiltration of physiologic solutions of Ca2, is log K, 2.9. Observations on implants of residues that containe a) CIP but not a %%%bone%%% morphogenetic property (BMP), B) BMP accompanied by CIP activity, or c) neither BMP nor CIP activity suggested that BMP covers CIP and that the two are attached to %%%bone%%% collagen in tandem. Whether CIP plays a part in calcification of the normal skeleton requires further investigation.
Record Date Created: 19770430
Record Date Completed: 19770430

2/7/201 (Item 201 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
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04062248 PMID: 4943353 Record Identifier: 72072661
The preparation of an alkali-soluble collagen from %%%demineralized%%% %%%bone%%%.
Kemp G D, Tristram G R
Biochemical journal (ENGLAND) Oct 1971, 124 (5) p915-9, ISSN 0264-6021--Print Journal Code: 2984726R
Publishing Model Print
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Other Citation Owner: NASA
Record type: MEDLINE; Completed
Ossein was solubilized by the action of alkali and a resulting high-molecular-weight fraction %%%isolated%%%. The chemical and physical properties of this fraction were studied and compared with those of an acid-soluble collagen prepared from calf skin by conventional techniques. From the results it is concluded that the alkali-soluble protein exhibits only minor differences from acid-soluble collagen, and that these differences can be ascribed for the most part to a decrease in the inter- and intramolecular cross-linking.
Record Date Created: 19720304
Record Date Completed: 19720304

2/7/202 (Item 1 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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0020056069 BIOSIS NO.: 200800103008
Urine release of systemically administered %%%bone%%% morphogenetic protein hybrid molecule
AUTHOR: Grgurevic Ovorka; Macek Boris; Erjavec Igor; Mann Matthias; Vukicevic Slobodan (Reprint)
AUTHOR ADDRESS: Univ Zagreb, Sch Med, Lab Mineralized Tissues, Salata 11, HR-10000 Zagreb, Croatia**Croatia
AUTHOR E-MAIL ADDRESS: vukicev@mef.hr
JOURNAL: JN Journal of Nephrology 20 (3): p311-319 MAY-JUN 2007 2007
ISSN: 1121-8428
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Background: Although it is well known that TGF-beta circulates, the presence and activity of endogenous %%%bone%%% morphogenetic proteins (BMPs) in biological fluids has not been studied. Here we investigated the urine secretion of a systemically administered BMP hybrid molecule.Methods: A dimeric recombinant human BMP molecule consisting of the BMP-7 prodomain and the BMP-6 mature domain was constructed and injected into Sprague Dawley rats. The blood was collected from the rats' orbital plexus, and 24-hour urine samples were pooled and %%%purified%%%

using a heparin sepharose column. Protein identity was confirmed by Western blot and by liquid chromatography-mass spectrometry (LC-MS) of the resulting peptides. Urine-derived protein from the 35-kDa band was bound to inactive %%%demineralized%%% %%%bone%%% matrix and implanted subcutaneously into rats.Results: Western blot analysis of sera demonstrated that BMP-7/6 remained intact in the rat plasma and could still be visualized 30 minutes after its systemic administration. Two protein bands at 35 and 39 kDa were detected with anti-BMP antibodies in the urine of rats, corresponding to the mature active BMP-6 dimer and the prodomain of BMP-7, respectively. LC-MS analysis detected only peptides derived from the BMP-7/6 molecule. Histological analysis of implanted pellets revealed formation of a new endochondral %%%bone%%% 14 days following implantation.Conclusions: These results show for the first time that systemically administered BMP-7/6 hybrid molecule is secreted into the urine and that its biological activity is preserved, suggesting that analysis of BMP in urine might reflect its presence in serum.

2/7/203 (Item 2 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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0019447144 BIOSIS NO.: 200700106885
Ectopic %%%bone%%% induction by equine %%%bone%%% protein extract
BOOK TITLE: Advances in Experimental Medicine and Biology
AUTHOR: Ll Haisheng (Reprint); Springer Marco; Zou Xuenong; Briest Arne; Buenger Cody
BOOK AUTHOR/EDITOR: Fisher JP (Editor)
AUTHOR ADDRESS: Aarhus Univ Hosp, Orthoped Res Lab, DK-8000 Aarhus, Denmark **Denmark
SERIES TITLE: ADVANCES IN EXPERIMENTAL MEDICINE AND BIOLOGY 585 p393-402
2006
BOOK PUBLISHER: SPRINGER-VERLAG BERLIN, HEIDELBERGER PLATZ 3, D-14197 BERLIN, GERMANY
CONFERENCE/MEETING: 2nd International Tissue Engineering Conference Crete, GREECE May 22 -27, 2005; 20050522
ISSN: 0065-2598_(print) ISBN: 0-387-32664-2 (H)
DOCUMENT TYPE: Book Chapter; Meeting
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: %%%Demineralized%%% %%%bone%%% matrix from horse has been reported to be osteoinductive. However, its performance was inferior to autogenous %%%bone%%% graft in terms of new %%%bone%%% formation. In the present experiment, an equine %%%bone%%% protein extract-COLLOSS E was investigated for its osteoinductivity in a rat model. At the mean time, carboxymethylcellulose (CMC) was tested as a potential carrier for the protein extract.18 male Wistar rats (8 weeks) were employed in the experiment. Each rat was implanted randomly with the 2 of the following implants, one on each side of the abdominal muscle. 1) COLLOSS E lyophilisate. 2) PEEK ring holder. 3) 3% or 10% CMC in gel or lyophilized form 4) COLLOSS E lyophilisate with 3% CMC, implanted as gel or in lyophilized form. 5) COLLOSS E suspension with 10% CMC, implanted as gel or in lyophilized form. The rats were followed up for 21 days. After termination, samples were subjected to macroscopic examination, plain radiograph, micro-CT and histological evaluations.The results showed that PEEK ring or CMC alone could not induce ectopic %%%bone%%% formation. COLLOSS E lyophilisate has a slightly higher (6 out of 7) positive %%%bone%%% formation rate over COLLOSS E/3% CMC (3 out of 5, both gel and lyophilized form), however, the difference is non-significant (p=0.36, Fisher's exact test). 10% CMC with COLLOSS E did not show ectopic %%%bone%%% formation when implanted as gel form (0/6), while 1 positive %%%bone%%% formation was found when implanted as the lyophilized form (1/4). %%%Bone%%% tissue volume ranged from 0 nun 3 to 23.1mm(3) for COLLOSS-E lyophilisate alone and 0 to 29.7mm(3) for COLLOSS E/3%CMC (gel or lyophilized form). We concluded that equine %%%bone%%% protein extract has the ability to induce ectopic %%%bone%%% formation in the rat model. CMC could be a potential carrier, however, further studies are needed to verify the proportion and efficacy. such as tricalcium phosphate and collagen sponge, CMC gel was employed in the present experiment. As a biocompatible material, CMC has been successfully used as carrier for 6 OP-1 and rhBMP-2 deliveries (15;16) . CMC alone has been found to raise the alkaline phosphatase activity of fibroblast and even encourage %%%bone%%% growth(15/17). In the present experiment, 3% CMC gel carrying 50mg of COLLOSS E performed just as good as COLLOSS E alone. CMC alone, either 3% or 10%, could not induce ectopic %%%bone%%% formation in this rat model. Even though no additional %%%bone%%% stimulation effect was introduced, CMC gave the COLLOSS E physical properties of either a gel or a lyophilized sponge, which made it much easy to handle during implantation. Higher percent CMC in liquid gel form somewhat inhibited the osteoinductivity of COLLOSS E. None out of the 8 samples gave rase to new %%%bone%%% formation. When the same mixture was implanted in lyophilized form, I out the 4 samples showed new %%%bone%%% tissue. The reason may be that higher concentration of CMC %%%isolated%%% COLLOSS E from direct interaction with the surrounding muscle tissue and provide no surface for early cell attachment due to its high viscosity, while lyophilized form could help this interaction during the rehydration process right after implantation. Another reason could be that the COLLOSS E used with 3% CMC was resuspended from the lyophilized form, which is different from the COLLOSS E suspension used with 10% CMC. Some bioactive proteins may be discarded with the supernatant when preparing the COLLOSS E suspension. Future approaches would be the addition of higher concentrations of collagen or related materials to facilitate the attachment and migration of cells attracted by COLLOSS E into the highly viscous gel.Inflammatory cell infiltration was noted on histological sections. They appeared mostly around the unabsorbed COLLOSS E material. Being a xenograft material, COLLOSS E could trigger minor immune reactions due to remodeling. Autoantibodies have been reported on treatment with bovine collagen implants in human, while neither adverse reactions to the bovine collagen implant nor any other clinical symptoms were observed(18). In the present experiment, we did not monitor the antibody formation because of our primary focus of osteoinductivity. We did not find any noticeable systemic or local reactions related to the implant.In conclusion, COLLOSS E has the ability to induce ectopic %%%bone%%% formation in the rat muscle pouch. 3% CMC gel could act as carrier or bulking agent either in gel or in lyophilized form. However, the optimal concentrations of different combinations need further investigation with multiple time points.

2/7/204 (Item 3 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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0019443685 BIOSIS NO.: 200700103426
%%%Purified%%% bovine matrix gla protein inhibits the in vitro calcification of devitalized arteries and %%%demineralized%%% %%%bone%%%.

AUTHOR: Villa E A (Reprint); Price P A
AUTHOR ADDRESS: Univ Calif San Diego, Dept Chem and Biochem, La Jolla, CA 92093 USA**USA
JOURNAL: Journal of Bone and Mineral Research 21 (Suppl. 1): pS345 SEP 2006 2006
CONFERENCE/MEETING: 28th Annual Meeting of the American-Society-for-Bone-and-Mineral-Research Philadelphia, PA, USA September 15 -19, 2006; 20060915
SPONSOR: Amer Soc Bone & Mineral Res
ISSN: 0884-0431
DOCUMENT TYPE: Meeting; Meeting Abstract
RECORD TYPE: Citation
LANGUAGE: English

2/7/205 (Item 4 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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17750764 BIOSIS NO.: 200400121521
The influence of alendronate on %%%bone%%% formation and resorption in a

rat ectopic %%%bone%%% development model.
AUTHOR: Yaffe Avinoam (Reprint), Kollerman Ron, Bahar Hila, Binderman Itzhak
AUTHOR ADDRESS: Department of Prosthodontics, School of Dental Medicine, Hebrew University Hadassah, P.O. Box 1172, Jerusalem, Israel**Israel
AUTHOR E-MAIL ADDRESS: yaffeavi@netvision.net.il
JOURNAL: Journal of Periodontology 74 (1): p44-50 January 2003 2003
MEDIUM: print
ISSN: 0022-3492
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Background: Most %%%bone%%% grafting techniques that include %%%bone%%% marrow, alloplastic materials, and extracellular %%%bone%%% matrix produce new %%%bone%%% mass, filling %%%bone%%% defects unpredictably. In most cases, the new %%%bone%%% undergoes resorption due to low local strains, resulting in significant %%%bone%%% loss. Recently, it was shown that alendronate and other bisphosphonates reduce %%%bone%%% loss when administered systemically or locally. The aim of this study was to investigate whether alendronate is effective on %%%bone%%% formation or %%%bone%%% resorption. Methods: A total of 64 rats were divided into 2 main groups. In all the rats, fresh %%%bone%%% marrow removed from DA young rats was placed into %%%demineralized%%% rat femur cylinders (DBMC) and implanted into subcutaneous sites of host DA rats, to form new %%%bone%%%. Group A served as an alendronate treatment group, and group B served as a non-treated control. Group A received 100 mul of 1.5 mg/ml alendronate solution at 1, 2, and 3 weeks (group A1) and at 3, 4, and 5 weeks (group A2). At designated times, the rats were sacrificed, and the implanted DBMC was dissected out of the thorax and processed for histological and microradiography image analysis. Results: Alendronate given at 1, 2, and 3 weeks (during the %%%bone%%% formation phase) did not increase the amount of %%%bone%%% or the visual %%%bone%%% density in comparison to the time-matched control, after 4 and 8 weeks. When alendronate was injected at 3, 4, and 5 weeks, the %%%bone%%% mass increased by 70% and by 166% after 6 and 10 weeks, respectively, in comparison to the untreated control. The visual %%%bone%%% density in group A2 was maintained at the level of 140+15 at 6 weeks and 152+15 at 10 weeks. The matched, non-treated control group B2 was significantly lower, 106+20 and 108+15, respectively. The histological sections showed that alendronate treatment at 3, 4, and 5 weeks maintained the normal appearance of the ossicle at 6 and 10 weeks in comparison to the osteopenic %%%bone%%% appearance in the matched controls. Conclusions: This study suggests that alendronate is effective in inhibiting %%%bone%%% loss, but ineffective during the %%%bone%%% formation phase. We suggest, therefore, that alendronate should be administered in procedures where %%%bone%%% resorption is expected.

2/7/206 (Item 5 from file: 5)
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17597795 BIOSIS NO.: 200300554226
The effect of bovine whey protein on ectopic %%%bone%%% formation in young growing rats.
AUTHOR: Kelly Owen, Cusack Siobhan, Cashman Kevin D (Reprint)
AUTHOR ADDRESS: Department of Food and Nutritional Sciences, University College, Cork, Ireland**Ireland
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JOURNAL: British Journal of Nutrition 90 (3): p557-564 September 2003 2003
MEDIUM: print
ISSN: 0007-1145
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The beneficial effect of bovine whey protein (WP) on %%%bone%%% metabolism has been shown in adult human subjects and ovariectomised rats. However, its effect on %%%bone%%% formation in earlier life, particularly during periods of %%%bone%%% mineral accrual, has not been investigated. Twenty-one male rats (4 weeks old, Wistar strain) were randomised by weight into three groups of seven rats each and fed ad libitum on a semi-%%%purified%%% low-Ca diet (3.0 g Ca/kg diet) containing 0 (control), 10 (diet WP1) or 20 (diet WP2) g bovine WP/kg for 47 d. On day 34 of the dietary intervention, all rats had two gelatine capsules containing demineralised %%%bone%%% powder implanted subcutaneously in the thorax region (a well-established in vivo model of ectopic %%%bone%%% formation). At 14 d after implantation, alkaline phosphatase activity (reflective of %%%bone%%% formation) in the %%%bone%%% implants from animals fed WP1 and -2 diets was almost 2-fold ($P < 0.01$) that of control animals. Insulin-like growth factor (IGF)-I mRNA levels were about 3-fold ($P < 0.05$) higher in implants from animals fed the WP diets compared with those from control animals. Serum- and urine-based biomarkers of %%%bone%%% metabolism and %%%bone%%% mineral composition in intact femora were unaffected by WP supplementation. In conclusion, the present findings suggest that bovine WP can enhance the rate of ectopic %%%bone%%% formation in young growing rats fed a Ca-restricted diet. This effect may be mediated by an increased synthesis of IGF-I in growing %%%bone%%%. The effect of WP on %%%bone%%% formation warrants further investigation.

2/7/207 (Item 6 from file: 5)
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16954377 BIOSIS NO.: 200200547888
Initiation and promotion of endochondral %%%bone%%% formation by %%%bone%%% morphogenetic proteins: Potential implications for avian tibial dyschondroplasia
AUTHOR: Reddi A H (Reprint)
AUTHOR ADDRESS: Center for Tissue Regeneration and Repair, Department of Orthopaedic Surgery, University of California, Davis, School of Medicine, Sacramento, CA, 95817, USA**USA
JOURNAL: Poultry Science 79 (7): p978-981 July, 2000 2000
MEDIUM: print
ISSN: 0032-5791
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The initiation and promotion of %%%bone%%% morphogenesis is regulated by %%%bone%%% morphogenetic proteins. Morphogenesis of the skeleton is the developmental cascade of pattern formation, establishment of mirror-image bilateral symmetry, initiation and promotion of endochondral %%%bone%%% differentiation, and growth culminating in functional weight bearing. Implantation of %%%demineralized%%% %%%bone%%% matrix initiates a developmental cascade of endochondral %%%bone%%% formation that is reminiscent of the sequential %%%bone%%% morphogenesis in the limb bud in the embryo. The inductive agents in the %%%demineralized%%% %%%bone%%% matrix were identified, %%%isolated%%% and cloned, and demonstrated to be %%%bone%%% morphogenetic proteins (BMP). The BMP have been implicated in the pattern formation, differentiation, and regeneration of %%%bone%%%. Because there is a persistent defect in endochondral %%%bone%%% formation in the epiphyseal growth plate in tibial dyschondroplasia in poultry, it is likely that BMP signaling mechanisms may be impaired.

2/7/208 (Item 7 from file: 5)
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16803159 BIOSIS NO.: 200200398670
What lies downstream of BMP in chondrogenesis?
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JOURNAL: FASEB Journal 16 (5): pA728 March 22, 2002 2002
MEDIUM: print
CONFERENCE/MEETING: Annual Meeting of Professional Research Scientists on Experimental Biology New Orleans, Louisiana, USA April 20-24, 2002; 20020420
ISSN: 0892-6638
DOCUMENT TYPE: Meeting; Meeting Abstract
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: %%%Bone%%% morphogenetic protein (BMP) was a term coined by Urist to describe the inductive effect of %%%demineralized%%% %%%bone%%% on skeletal muscle in vivo and in vitro. Cells of muscle formed endochondral %%%bone%%% in vivo and hyaline cartilage in vitro. Molecular cloning studies led to the %%%isolation%%% of several new members of the TGFbeta superfamily that fulfill the functional definition of BMP. Studies in vitro, however, could not reproduce this same effect when the tissue to be induced was skeletal muscle, a tissue normally devoid of chondrogenic potential. This observation suggested that "BMP" might function to induce a downstream regulator that was present in responsive tissue such as limb mesenchyme, where chondrogenic and myogenic progenitors coexist, but not in a tissue such as muscle, where the capacity to form cartilage was repressed or inherently absent. Using subtractive hybridization, this laboratory has succeeded in %%%isolating%%% several novel clones that are expressed in response to the Urist inductor, and are appropriately expressed in a prechondrogenic fashion. In-situ hybridization supports the proposition that one or more of these clones may represent the true Urist regulator.

2/7/209 (Item 8 from file: 5)
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16418984 BIOSIS NO.: 200200012495
Osteoinductive protein matures and %%%purification%%% processes
AUTHOR: Poser J W; Benedict J J
AUTHOR ADDRESS: 12180 W. 18th Dr., Lakewood, Colo. 80215, USA**USA
JOURNAL: Official Gazette of the United States Patent and Trademark Office Patents 1169 (1): p466-467 Dec. 6, 1994 1994
MEDIUM: print
ISSN: 0098-1133
DOCUMENT TYPE: Patent
RECORD TYPE: Citation
LANGUAGE: English

2/7/210 (Item 9 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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15950100 BIOSIS NO.: 200100121939
Deriving AMS radiocarbon age of fossil %%%bone%%% by pretreatment with XAD-2 resin: Comparison with the gelatin extraction method
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AUTHOR ADDRESS: Department of Earth and Planetary Sciences, Graduate School of Sciences, Nagoya University, Furo-cho, Chikusa-ku, Nagoya, 464-8602, Japan**Japan
JOURNAL: Quaternary Research (Tokyo) 39 (6): p547-557 December, 2000 2000
MEDIUM: print
ISSN: 0418-2642
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: Japanese

ABSTRACT: Accurate radiocarbon (14C) and carbon isotope measurements of fossil bones require complete removal of all exogenous carbon. XAD-2 chromatography was used to eliminate the foreign organic matter from bones. The fossil bones used in the experiment were animal %%%bone%%% fragments collected at the Awazu submarine archeological site. The %%%bone%%% samples were %%%demineralized%%% with 0.8M HCl at 4degreeC, and the acid-insoluble residue was concentrated by centrifugation and lyophilized. The %%%demineralized%%% %%%bone%%% powder was hydrolysed with 6M HCl at 110degreeC. Solid components were removed by centrifugation before the filtered hydrolysate was passed through the XAD-2 resin used for removal of fulvic acids. In addition, the gelatin extraction method of decalcification in a cellulose tube with 1.2M HCl, followed by heating at 90degreeC in water was used for the same species to compare the ability of the two methods to remove organic contaminants. The %%%purified%%% hydrolysates obtained from XAD-2 chromatography have more positive delta13C values and older 14C ages than gelatin collagens extracted from hot water. The difference tends to become greater for poorly preserved fossil bones containing less than 0.7% collageneous materials. The fulvic phases give apparently younger ages and significantly more negative delta13C values than %%%bone%%% organic carbon. Furthermore, the XAD-treated hydrolysates of gelatin collagens give the same 14C ages (older than those of gelatin collagens) as the XAD-%%%purified%%% hydrolysates. The result indicates that the gelatin extraction method is sufficient for 14C dating on well-preserved bones, but insufficient on poorly preserved bones, because hot-water extraction does not totally remove exogenous organic carbon. Therefore, XAD-2 resin is recommended for accurate 14C and carbon isotope measurements.

2/7/211 (Item 10 from file: 5)
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14920432 BIOSIS NO.: 199900180092
Method for the %%%isolation%%% and %%%purification%%% of oyridinoline and deoxypyridinoline crosslinks from %%%bone%%% by liquid chromatographic techniques
AUTHOR: Meddah B (Reprint); Giroud S Kamel C; Brazier M
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JOURNAL: Preparative Biochemistry and Biotechnology 29 (1): p63-75 Feb., 1999 1999
MEDIUM: print
ISSN: 1082-6068
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Significant progress has been made in recent years in the development of new %%%bone%%% resorption markers, based principally on the urinary excretion of pyridinoline (Pyd) and deoxypyridinoline (Dpd) crosslinks. For their measurement in spite of the recent development of immunoassays, HPLC remains the method of reference. However, the lack of an appropriate internal standard requires large amounts of pure crosslinks for external standardisation. Herein, we describe an efficient method for the %%%isolation%%% of both crosslinks from %%%bone%%% of adult turkey by isocratic semi-preparative HPLC. %%%Demineralized%%% %%%bone%%% is hydrolysed in hydrochloric acid, 9 M. A first liquid extraction step in butanol allowed to eliminate less polar compounds. The aqueous phase was concentrated and separated by gel filtration on Biogel P2 and eluted by acetic acid solution (10%). Fractions containing pyridinoline were pooled, concentrated, and %%%purified%%% on a CF1 cellulose column. Pyd and Dpd crosslinks were then separated isocratically by HPLC on a C18 reversed phase column (Vydac 218 TP 10!0, 250X10 mm) and eluted with HFBA as the ion-pairing agent. Retention times of Pyd and DPD were 23.6 and 28.7 min, respectively. Both crosslinks prepared by HPLC were then transformed as hydrochloride to cellulose phosphate and desalted on Sephadex G-10 columns. These two further steps yielded highly %%%purified%%% compounds (the purity was greater than 98% evaluated by aminoacid analysis). In conclusion, the efficiency of this method allows to obtain rapidly Pyd and Dpd without interfering compounds as proven by spectral studies (NMR and mass spectroscopy).

2/7/212 (Item 11 from file: 5)

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14740883 BIOSIS NO.: 199900000543
Biochemical and biophysical characterization of refolded Drosophila DPP, a homolog of %%%bone%%% morphogenetic proteins 2 and 4
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JOURNAL: Journal of Biological Chemistry 273 (44): p29052-29065 Oct. 30, 1998 1998
MEDIUM: print
ISSN: 0021-9258
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The mature C-terminal signaling domain of the Drosophila Decapentaplegic proprotein (DPP) can be efficiently refolded from chaotrope-solubilized inclusion bodies with the aid of a membrane protein-solubilizing detergent, high concentrations (0.75-2 M) of NaCl, and low temperatures (5-15degree C). The disulfide-linked homodimeric product contains N-terminal heparin-binding sites that were utilized as intrinsic affinity tags to obtain a highly enriched preparation in one chromatographic step. A subsequent C4 reverse phase high pressure liquid chromatography step provides high purity, salt-free protein that is amenable to biophysical and structural studies at a yield of approximately 3 mg/liter of bacterial culture. The dimeric protein is correctly folded as determined by electrophoretic, spectroscopic, chemical,a nd proteolytic analyses. Refolded DPP is also bioactive as shown by induction of chondrogenesis in embryonic chick limb bud cells and by high affinity binding to Noggin, an antagonist of %%%bone%%% morphogenetic protein signaling. In contrast to %%%bone%%% morphogenetic proteins extracted from %%%demineralized%%% %%%bone%%% or overexpressed in cell culture, the refolded Escherichia coli-expressed protein is not glycosylated at a conserved N-linked site and is therefore homogeneous. The C-terminal domain dimer is more hydrophobic and thus less soluble than its unfolded or partially folded forms, necessitating highly solubilizing conditions for recovery after folding in vitro. Hence solubilization of the mature ligand may be one of the principal roles of the large (250-400 amino acids) N-terminal prodomains of transforming growth factor-beta superfamily members, shown to act as intramolecular chaperones in vivo.

2/7/213 (Item 12 from file: 5)
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13735241 BIOSIS NO.: 199799369301
Effects of indomethacin on early events in %%%demineralized%%% %%%bone%%% matrix-induced osteogenesis
AUTHOR: Yazdi M; Kossari S, Di Cesare P E; Cheung D T; Strates B S; Nimni M E (Reprint)
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JOURNAL: European Journal of Experimental Musculoskeletal Research 4 (3-4): p138-145 1995 1995
ISSN: 0803-5296
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: We have previously reported that treatment with non-steroidal anti-inflammatory drugs during or after the implantation of %%%demineralized%%% %%%bone%%% matrix (DBM) in rats had no significant effect on its capacity to form new %%%bone%%%. When treatment with indomethacin was initiated at least 6 h prior to implantation at a dose of 4 mg/kg body weight, an inhibitory effect on %%%bone%%% formation was observed. In the present study, we induced the production of polymorphonuclear leukocytes and macrophages in the peritoneal cavity of rats by DBM particles and %%%isolated%%% the cells 6 h post-implantation using a Ficoll-Hypaque density gradient. Incubation of neutrophil- and monocyte-enriched cell fractions of supernates of the soluble fraction of degranulated neutrophils and monocytes with DBM particles for 2-4 h prior to implantation in indomethacin-treated animals resulted in new %%%bone%%% formation. The results of this study suggest that a factor present in polymorphonuclear leukocytes and macrophages appears to be modulated by indomethacin and is necessary for the initiation of the cascade of developmental or tissue repair events that leads to the formation of new %%%bone%%%.

2/7/214 (Item 13 from file: 5)
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13539191 BIOSIS NO.: 199699173251
Hemopoietic activity of stromal cell lines with osteogenic potential %%%isolated%%% from developing ossicles
AUTHOR: Bleiberg I; Offer M
AUTHOR ADDRESS: Cell Biol. Histol. Dep., Med. Sch., Tel Aviv Univ., Tel Aviv, Israel**Israel
JOURNAL: Experimental Hematology (Charlottesville) 24 (9): p1096 1996 1996
CONFERENCE/MEETING: 25th Annual Meeting of the International Society for Experimental Hematology New York, New York, USA August 23-27, 1996; 19960823
ISSN: 0301-472X
DOCUMENT TYPE: Meeting; Meeting Abstract
RECORD TYPE: Citation
LANGUAGE: English

2/7/215 (Item 14 from file: 5)
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13184681 BIOSIS NO.: 199696852514
The use of an osteoinductive growth factor for lumbar spinal fusion: Part II. Study of dose, carrier, and species
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JOURNAL: Spine 20 (24): p2633-2644 1995 1995
ISSN: 0362-2436
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: Study Design. Efficacy of a bovine-derived osteoinductive growth factor was studied in a rabbit model and in a nonhuman primate model of posterolateral lumbar spinal fusion. Objectives. To determine the minimum effective dose of growth factor and the influence of different carrier material on the outcome of intertransverse process lumbar fusion. Summary of Background Data. %%%Bone%%% morphogenetic proteins and related growth factors are becoming increasingly available in %%%purified%%% extract or genetically engineered forms and are capable of inducing new %%%bone%%% formation in vivo. Osteoinductive growth factors to enhance lumbar spinal fusion have not been well studied in models of posterolateral intertransverse process fusion. Because of the diminished potential of %%%bone%%% regeneration in primates (including humans) compared with phylogenetically lower animals, extrapolations regarding dose and efficacy cannot be made directly from results obtained in experiments performed on phylogenetically lower animals. Experiments on non-human primates are a critical step before attempting to use these growth actors in humans. Methods. One hundred fifteen adult New Zealand white rabbits and 10 adult rhesus macaques underwent single level posterolateral intertransverse process lumbar spinal arthrodesis to evaluate different doses and carrier materials for a bovine-derived osteoinductive

%%%bone%%% protein extract. Rabbit fusion masses were evaluated 5 weeks after arthrodesis by manual palpation, radiography, biomechanical testing, and light microscopy. Monkey fusion masses were evaluated 12 weeks after arthrodesis by radiography and light microscopy. Results. Successful posterolateral intertransverse process spinal fusions were achieved in the rabbit model using an osteoinductive growth factor with three different carriers (autogenous iliac %%%bone%%%, %%%demineralized%%% allogeneic %%%bone%%% matrix, and natural coral). There was a dose-dependent response to the osteoinductive growth factor in the rabbit model, indicating that a threshold must be overcome before %%%bone%%% formation is induced. The methodology for biologic enhancement of spinal fusion developed in the rabbit model was transferred successfully to the rhesus monkey, where the use of the osteoinductive growth factor with a %%%demineralized%%% %%%bone%%% matrix carrier resulted in spinal fusion in 12 weeks. Conclusions. These experiments provide an essential building block in the understanding of the biology of spinal fusion and the use of osteoinductive growth factors to enhance a posterolateral intertransverse process spinal fusion. The achievement of posterolateral spinal fusion in the rhesus monkey using an osteoinductive growth factor is a significant step toward the biologic enhancement of spinal fusion in humans.

2/7/216 (Item 15 from file: 5)
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12670448 BIOSIS NO.: 199598138281
Assessment of the Protein Quality of Beefstock %%%Bone%%% %%%Isolates%%% for Use as an Ingredient in Meat and Poultry Products
AUTHOR: Zarkadas Constantinos G (Reprint); Yu Ziran; Zarkadas George C; Minero-Amador Adolfo
AUTHOR ADDRESS: Plant Res. Cent., Cent. Exp. Farm, Res. Branch, Agric. Canada, Ottawa, ON K1A 0C6, Canada**Canada
JOURNAL: Journal of Agricultural and Food Chemistry 43 (1): p77-83 1995
1995
ISSN: 0021-8561
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The total protein, amino acids including 4-hydroxyproline, and estimated connective tissue proteins of three processed beefstock %%%bone%%% %%%isolates%%% were determined as potentially useful indices for evaluating their protein quality. Variations in amino acid composition were found among all three batches of beefstock %%%bone%%% %%%isolates%%% investigated. The total protein of %%%demineralized%%% beefstock %%%bone%%% powders, as determined by amino acid analysis, varied (P lt 0.05) and ranged from 78 to 80% on a dry weight basis. Compared to the FAO/WHO essential amino acid (EAA-9) reference value of 33.9%, mean values for total EAA ranged from 22.2 to 22.9%, and the calculated mean protein efficiency ratio values (PER) ranged from 1.35 to 1.54. Total connective tissue proteins (72.3-81.1%) were determined from the amounts of 4-hydroxyproline present. It is concluded that this %%%demineralized%%% %%%bone%%% product may be used in limited amounts in meat mixtures without significant effect on the nutritive value.

2/7/217 (Item 16 from file: 5)
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12354926 BIOSIS NO.: 199497376211
The effect of recombinant human osteogenic protein-1 on healing of large segmental %%%bone%%% defects
AUTHOR: Cook Stephen D (Reprint); Baffes Gregory C (Reprint); Wolfe Michael W (Reprint); Kuber-Sampathy T; Rueger David C; Whitecloud Thomas S III (Reprint)
AUTHOR ADDRESS: Dep. Orthopaedic Surgery, Tulane Univ. Sch. Med., 1430 Tulane Avenue, New Orleans, LA 70112, USA**USA
JOURNAL: Journal of Bone and Joint Surgery American Volume 76 (6): p 827-838 1994 1994
ISSN: 0021-9355
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: A rabbit ulnar non-union model was used to evaluate the effect of recombinant human osteogenic protein-1 on the healing of a large segmental osteoperiosteal defect. A 1.5-centimeter segmental defect was created in the mid-part of the ulnar shaft of adult rabbits. The defect was filled with an implant containing either recombinant human osteogenic protein-1 or naturally occurring bovine osteogenic protein. The recombinant human osteogenic protein-1 implants consisted of a carrier of 125 milligrams of %%%demineralized%%%, guanidine-extracted, insoluble rabbit %%%bone%%% matrix (the collagen carrier), reconstituted with 3.13, 6.25, 12.5, twenty-five, fifty, 100, 200, 300, or 400 micrograms of recombinant human osteogenic protein-1. Animals that received recombinant human osteogenic protein-1 were compared with animals that received an implant of 250 micrograms of a preparation of naturally occurring bovine osteogenic protein mixed with the collagen carrier. Limbs that served as controls received either the collagen carrier alone or no implant at all. The treated and the untreated defects were examined radiographically and histologically at eight or twelve weeks after implantation. Mechanical testing was performed on six animals. All implants of recombinant human osteogenic protein-1, except for those containing 3.13 micrograms of the substance, induced complete radiographic osseous union within eight weeks. The defects that were treated with an implant of bovine osteogenic protein also healed within this time-period. The %%%bone%%% induced by both types of implants had new cortices with advanced remodeling and marrow elements. Histological evaluation of this new %%%bone%%% at eight weeks postoperatively revealed primarily lamellar %%%bone%%%, with the formation of new cortices and normal-appearing marrow elements. The average torsional strength and energy, absorption capacity of the union induced by recombinant human osteogenic protein-1 was comparable with that of intact %%%bone%%%. The control defects that had been implanted with collagen carrier alone and those with no implant showed no bridging of the defect. CLINICAL RELEVANCE: Segmental %%%bone%%% loss and non-union are challenging problems for orthopaedic surgeons. The results of this study demonstrate that a highly %%%purified%%% recombinant human osteogenic protein is capable of inducing healing in a large %%%bone%%% defect in an animal model. The type of implant used in this study may provide an alternative to the use of autogenous graft and allograft %%%bone%%% in the reconstruction of %%%bone%%% defects caused by trauma, neoplasia, or infection. The use of osteogenic proteins to augment or replace %%%bone%%% grafts may reduce the number of operations needed to treat such conditions and may circumvent the risk of transmission of infection that is associated with the transplantation of allografts and autogenous grafts.

2/7/218 (Item 17 from file: 5)
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11791282 BIOSIS NO.: 199395093548
The effect of a composite of polyorthoester and %%%demineralized%%% %%%bone%%% on the healing of large segmental defects of the radius in rats
AUTHOR: Solheim Eirik (Reprint); Pinholt Else Marie; Andersen Rune; Bang Gisle; Sudmann Einar
AUTHOR ADDRESS: Hagavik Orthopaedic Hosp., Univ. Bergen, N-5220 Hagavik, Norway**Norway
JOURNAL: Journal of Bone and Joint Surgery American Volume 74 (10): p 1456-1463 1992
ISSN: 0021-9355
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English

ABSTRACT: The effect of a composite of %%%demineralized%%% %%%bone%%% mixed
with polyorthoester on the healing of large segmental defects in the rat radius was studied. Sixty male Wistar rats were divided into four groups, A through D, and an osteoperiosteal diaphyseal defect of 50 per cent of the length of the %%%bone%%% was made in the right radius of each rat. In Group A, the defect was filled with polyorthoester and %%%demineralized%%% %%%bone%%%; in Group B, %%%demineralized%%% %%%bone%%%; and in Group C, polyorthoester. No material was implanted in the defects in the Group-D rats. The rats were killed fifty days post-operatively. The formation of %%%bone%%% in the defects was quantified with computer-assisted measurements of the area on radiographs. The host-tissue response was evaluated with light microscopy. Defects that had been filled with the composite of polyorthoester and %%%demineralized%%% %%%bone%%% or with %%%demineralized%%% %%%bone%%% alone showed regeneration of %%%bone%%% corresponding to 93.6 and 77.6 per cent of the area of the defect, respectively. Defects that had no implant or that had been filled with polyorthoester alone showed significantly less formation of %%%bone%%%. No inflammation was seen with light microscopy, and only traces of the polyorthoester could be detected in the defects that had been filled with the composite or with polyorthoester alone. Clinical relevance: A biodegradable carrier is desirable for %%%demineralized%%% %%%bone%%% chips or powder, which otherwise are technically difficult to use because of lack of adhesion of %%%demineralized%%% %%%bone%%% particles to each other and to the surrounding tissue. In addition, as %%%purified%%% %%%bone%%% inductors and growth factors become available, a biodegradable carrier will be needed to provide sustained release of such factors. In the current study, the %%%demineralized%%% %%%bone%%% mixed rapidly with blood, forming a grainy mixture that tended to be displaced, whereas the composite implant was moldable and easy to place in the defect, and the tendency for displacement was less. The polyorthoester also provided local hemostasis when used either alone or in a composite with %%%demineralized%%% %%%bone%%%. Because the polyortheoster may provide controlled, sustained release of the incorporated active substance, it seems promising as a carrier of %%%purified%%% inductors and growth factors.

2/7/219 (Item 18 from file: 5)
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10743947 BIOSIS NO.: 199191126838
NON-COLLAGENOUS PROTEINS IN PORCINE MANDIBLE
AUTHOR: YAMAGUCHI H (Reprint)
AUTHOR ADDRESS: DEP PERIODONTICS ENDODONTICS, TSURUMI UNIV SCH DENTAL MED**
JAPAN
JOURNAL: Tsurumi University Dental Journal 17 (1): p87-100 1991
ISSN: 0385-020X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: JAPANESE

ABSTRACT: In order to make clear the unique features of the organic matrix of alveolar %%%bone%%%, this study aimed at the characterization of non-collagenous proteins which comprised the mineralized extracellular matrix of the %%%bone%%%. A sample of compact %%%bone%%% and spongy %%%bone%%% was separated from the alveolar processes of porcine mandibles. After removal of non-mineralized components by extraction with 4 M guanidine HCl-0.5 M tris buffer, the powdered sample %%%bone%%% samples were %%%demineralized%%% sequentially with 0.5 M acetic acid. The protein samples extracted by the sequential demineralization were chromatographed on a TSK 3000 SW column. The fractions eluted from the column were subjected to amino acid analysis and SDS polyacrylamide gel electrophoresis. One of the protein fractions obtained from the spongy %%%bone%%% was further %%%purified%%% by reversed phase high performance liquid chromatography, and was subjected to sequence analysis. The results were as follows. The amount of the non-collagenous proteins extracted from the spongy %%%bone%%% during the demineralization procedure was more than that from the compact %%%bone%%%. The major proteins found in both the compact %%%bone%%% and the spongy %%%bone%%% was a protein whose molecular weight was estimated to be 68.4 kDa being rich in aspartic acid, glutamic acid, glycine and alanine, and a 56.2 kDa protein being rich in aspartic acid and glutamic acid. The non-collagenous proteins, which were contained in a very small amount but which seemed to be specific for the spongy %%%bone%%% was a 21.5 kDa protein being rich in glutamic acid, aspartic acid, alanine but the serine content was not high. The amino acid sequence of the 1.2 kDa protein was identical with that of known porcine osteocalcin.

2/7/220 (Item 19 from file: 5)
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10686550 BIOSIS NO.: 199191069441
IN-VITRO CHEMOTACTIC RESPONSE OF OSTEOSARCOMA CELLS TO A PARTIALLY %%%PURIFIED%%% PROTEIN EXTRACT OF %%%DEMINERALIZED%%% %%%BONE%%% MATRIX
AUTHOR: PADLEY R A (Reprint); COBB C M; KILLOY W J; NEWHOUSE N L; BOYAN B D
AUTHOR ADDRESS: UNIV MISSOURI KANSAS CITY, SCH DENT, DEP PERIODONTICS, 650
EAST 25TH ST, KANSAS CITY, MO 64108, USA**USA
JOURNAL: Journal of Periodontology 62 (1): p15-20 1991
ISSN: 0022-3492
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: The purpose of this investigation was to evaluate the chemotactic potential of a partially %%%purified%%% protein extract from %%%bone%%% matrix when tested against osteosarcoma cells with osteoblast characteristics. The chemotactic response of ROS 17/2 cells to a lyophilized bovine %%%bone%%% extract %%%purified%%% to "Urist step eight" was evaluated in Boyden blind well chambers. A checkerboard design was employed to test cell migration against positive, negative, and no concentration gradients, thereby controlling the effects of chemokinesis and/or random migration on results. The results demonstrate that the partially %%%purified%%% protein extract from bovine %%%bone%%% matrix is chemotactic since more cells migrated to positive gradients than to negative gradients (P <.01). The chemotactic effect was confirmed by an increase in cell migration toward positive gradients of the %%%bone%%% extract compared to cell migration in the presence of no gradient (P <.01). When no gradient was present, the cells exhibited an increased response in the presence of equal concentrations of the %%%bone%%% extract (P <.01) indicating a chemokinetic effect. The proteinaceous nature of the chemoattractant was confirmed by its susceptibility to trypsin digestion and heat exposure.

2/7/221 (Item 20 from file: 5)
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10240550 BIOSIS NO.: 199090025029
STUDIES OF EXTRACTION %%%PURIFICATION%%% AND CHARACTERIZATION OF A
%%%BONE%%%-INDUCING SUBSTANCE OBTAINED FROM BOVINE %%%BONE%%% MATRIX
AUTHOR: YAMA M (Reprint)
AUTHOR ADDRESS: 1ST DEP ORAL AND MAXILLOFACIAL SURG, TOKYO DENT COLL, CHIBA
260, JPN** JAPAN
JOURNAL: Shikwa Gakuho 90 (1): p1-20 1990
ISSN: 0037-3710
DOCUMENT TYPE: Article

RECORD TYPE: Abstract
LANGUAGE: JAPANESE

ABSTRACT: The %%%bone%%%-inducing substance extracted from %%%demineralized%%%, defatted bovine %%%bone%%% matrix by means of a 6M guanidine hydrochloride solution was designated cortical %%%bone%%% factor (CBF). CBF cascade %%%bone%%% induction and the %%%bone%%% -induction process were investigated. In addition, in an attempt to produce %%%bone%%%, partial analysis was made of the chemical structure of components of the fraction activating induction. Results 1. A 6M guanidine hydrochloride solution extracted more %%%bone%%%-inducing substance of equal %%%bone%%%-inductiveness more efficiently than did the 4M guanidine hydrochloride solution formerly used. 2. CBF typically induced endochondral ossification and hemopoiesis. In the first week, chondroblast-like cells aggregated. In the second week, cartilage was induced; and in the third week, cartilage was observed being replaced by %%%bone%%%. 3. After CBF was %%%purified%%% by gel-filtration, 4 fractions were obtained. The second and third fractions (CBF II and III) demonstrated %%%bone%%%-inducing activity. Such activity was especially high in the case of CBF III. 4. In SDS-PAGE, CBF III and 2 major and a few minor bands. The 5 bands were a common NH2-terminal amino-acid sequence. CBF III before electrophoresis was showed that the first 15 amino acids are common to the 5 bands sequence. All sequences were the same as the bovine osteocalcin NH2-terminal region. 5. Common-sequence peptide was synthesized, and an antibody specific to this peptide was produced. This antibody reacted to the 5 bands in the SDS-PAGE, suggesting that the 5 bands have a common sequence.

2/7/222 (Item 21 from file: 5)
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10128564 BIOSIS NO.: 199089046455
ORIGIN AND DIFFERENTIATION OF OSTEOCLASTS ELUCIDATED BY HISTOCHEMICAL AND
IMMUNOHISTOCHEMICAL STUDIES ON CARBONIC ANHYDRASE LOCALIZATION AND
ANTI-OSTEOCLAST MONOCLONAL ANTIBODY REACTIVITY
AUTHOR: KADOYA Y (Reprint)
AUTHOR ADDRESS: 2ND DEP PATHOL, OSAKA CITY UNIV MED SCH**JAPAN
JOURNAL: Journal of the Osaka City Medical Center 37 (4): p765-784 1988
ISSN: 0386-4103
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: JAPANESE

ABSTRACT: Carbonic anhydrase (CA) localized in osteoclasts (Ocs) has been postulated to play a crucial role in acid production and the subsequent %%%bone%%% resorption. In the present study, CA was %%%purified%%% from erythrocytes of Gallus domesticus using affinity chromatography. The antibody against the %%%purified%%% enzyme (MW 30,000) raised in rabbits showed no immunological cross reaction with CA I and II from human erythrocytes. Ocs demonstrated strong immunoreactivity to this antibody in the cytoplasm, while other %%%bone%%% cells such as osteoblasts and osteocytes were all negative. Some mononuclear cells adjacent to or facing the %%%bone%%% surface also showed a positive immunoreactivity. They were considered to be cells about to resorb %%%bone%%% and may be the precursors of Ocs. To elucidate the mechanism of Ocs differentiation, using CA and anti-Oc monoclonal antibody reactivity as markers, histochemical and immunohistochemical experiments were done using the reactive multinucleated giant cells (MNGCs) as well as Ocs. For the induction of reactive MNGCs, particles of %%%bone%%% (BP), %%%demineralized%%% %%%bone%%% (DBP), hydroxyapatite (HA) and egg shell (ES) were grafted onto the chorioallantoic membrane of chick embryos. The reactive tissues around the grafted particles and medullary %%%bone%%% containing Ocs were used for the following stainings. Histochemically, tartrate-resistant acid phosphatase (TR-ACP) and CA were examined. Immunohistochemically, stainings were made using anti-avian CA antibody and anti-Oc monoclonal antibody. ACP activity was positive in all MNGCs, but in MNGCs around DBP, the activity was weaker than in other cells and was tartrate sensitive. TR-ACP activity was positive in MNGCs around BP, HA, and ES and the intensity and distribution were much the same all among these cells. Ocs showed strong TR-ACP activity in the cytoplasm. And TR-ACP activity was also demonstrated along the %%%bone%%% surface undergoing resorption particularly when %%%bone%%% resorption was stimulated by feeding hens on a low Ca diet. Histochemically, CA activity was positive in MNGCs around BP and also in those around ES. The former showed moderate activity, a very similar reaction to that of Ocs, in intensity and distribution. Among the latter, many cells showed intense CA activity, generally much more intense than that of Ocs. MNGCs around DBP occasionally showed strong but irregular CA activity. MNGCs around HA showed no CA activity. All sections, incubated in the presence of 10-6 M acetazolamide, showed no reaction products. Immunohistochemically, MNGCs around BP showed moderate CA reactivity while those around ES revealed intense reactivity. Differing from the above histochemical observations, many MNGCs around DBP showed a uniform and intense immunoreactivity. The monoclonal antibody against Ocs reacted with MNGCs around BP, and in addition, unexpectedly with MNGCs around ES. These results suggest that carbonic anhydrase could be a useful and reasonable marker for Ocs as this enzyme is related acid production. And the histochemical and immunohistochemical similarities of these reaction between Ocs and MNGCs around the %%%bone%%% particles suggest that constituents present in %%%bone%%% may play an important role in the differentiation of Ocs.

2/7/223 (Item 22 from file: 5)
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09608882 BIOSIS NO.: 198987056773
DISSOCIATIVE EXTRACTION AND PARTIAL %%%PURIFICATION%%% OF OSTEOGENIN A
%%%BONE%%% INDUCIVE PROTEIN FROM RAT TOOTH MATRIX BY HEPARIN AFFINITY
CHROMATOGRAPHY
AUTHOR: KATZ R W (Reprint); REDDI A H
AUTHOR ADDRESS: CLINICAL INVESTIGATIONS AND PATIENT CARE BRANCH, NATL INST
DENTAL RES, NATL INST HEALTH, BETHESDA, MD 20892, USA**USA
JOURNAL: Biochemical and Biophysical Research Communications 157 (3): p 1253-1257 1988
ISSN: 0006-291X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: Implantation of %%%demineralized%%% tooth matrix in subcutaneous sites results in new one formation locally. The osteoinductive activity of the tooth matrix was dissociatively extracted in 4.0 M guanidine hydrochloride and the residue was devoid of biologic activity. The %%%bone%%% inductive protein, osteogenin, was partially %%%purified%%% by heparin affinity chromatography. The heparin binding fraction initiated the %%%bone%%% differentiation cascade when implanted with guanidine extracted, inactive %%%bone%%% or tooth matrices. These results imply a cooperative interaction between the soluble osteogenin and collagenous substratum in %%%bone%%% induction.

2/7/224 (Item 23 from file: 5)
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09494218 BIOSIS NO.: 198937071967
HISTOLOGIC EVALUATION OSTEOGENIC MATERIALS IN REGENERATION OF HUMAN
INTRABONY DEFECTS
AUTHOR: BOWERS G (Reprint); FELTON F; MIDDLETON C; MELLONIC J; CORIO R; EMERSON J; ROMBERG E
AUTHOR ADDRESS: UNIV MD, BALTIMORE, USA**USA

JOURNAL: Journal of Dental Research 68 (SPEC. ISSUE JUNE): p1021 1989
CONFERENCE/MEETING: 67TH GENERAL SESSION OF THE INTERNATIONAL ASSOCIATION
FOR DENTAL RESEARCH (IADR). 6TH MEETING OF THE IADR IRISH DIVISION. 72ND ANNUAL MEETING OF THE SCANDINAVIAN ASSOCIATION FOR DENTAL RESEARCH AND THE
26TH ANNUAL MEETING OF THE CONTINENTAL EUROPEAN DIVISION OF THE IADR, DUBLIN, IRELAND, JUNE 28-JULY 1, 1989. J DENT RES.
ISSN: 0022-0345
DOCUMENT TYPE: Meeting
RECORD TYPE: Citation
LANGUAGE: ENGLISH

2/7/225 (Item 24 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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09362869 BIOSIS NO.: 198936071760
%%%PURIFICATION%%% OF AN OSTEOINDUCTIVE FACTOR FROM BOVINE %%%DEMINERALIZED%%% %%%BONE%%%
AUTHOR: BENTZ H (Reprint); NATHAN R; ROSEN D; ARMSTRONG R; THOMPSON A; SEGARINI P; MATHEWS M; DASCH J; PIEZ K; SEYEDIN S
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CALIF 94303, USA**USA
JOURNAL: Journal of Cell Biology 107 (6 PART 3): p162A 1988
CONFERENCE/MEETING: JOINT MEETING OF THE AMERICAN SOCIETY FOR CELL BIOLOGY
AND THE AMERICAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY, SAN
FRANCISCO, CALIFORNIA, USA, JANUARY 29-FEBRUARY 2, 1989. J CELL BIOL.
ISSN: 0021-9525
DOCUMENT TYPE: Meeting
RECORD TYPE: Citation
LANGUAGE: ENGLISH

2/7/226 (Item 25 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)
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08719617 BIOSIS NO.: 198784073766
%%%PURIFICATION%%% OF %%%BONE%%% MORPHOGENETIC PROTEIN BMP AND FUNDAMENTAL
STUDIES ON IT'S CLINICAL APPLICATION
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AUTHOR ADDRESS: SECOND DEP ORAL SURGERY, FAC DENTISTRY, TOKYO MED AND
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JOURNAL: Journal of the Stomatological Society Japan 54 (1): p91-105 1987
ISSN: 0300-9149
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: JAPANESE

ABSTRACT: %%%Bone%%% morphogenetic protein (BMP) induces the differentiation of the mesenchymal cells into the cartilage and %%%bone%%%. In the clinical application of BMP as a substitute for the %%%bone%%% graft, some carriers or substrata which can enhance the action of BMP are necessary, because it is very difficult to obtain the BMP. In this study, the author attempted to %%%purify%%% the BMP from the bovine %%%bone%%% and to find the materials for the carrier of BMP. The bovine %%%demineralized%%% %%%bone%%% matrix was extracted with 4M Gdn-HCl and the BMP was %%%purified%%% by means of gel filtration and cation ion exchange chromatography from the Gdn-HCl extracted proteins. The partially %%%purified%%% BMP was combined with various materials and implanted in the subcutaneous tissue of rats to assay the %%%bone%%% -inductive activity. The results of the %%%purification%%% of BMP with ion exchange chromatography from the Gdn-HCl extracted proteins. The partially %%%purified%%% BMP was combined with various materials and implanted in the subcutaneous tissue of rats to assay the %%%bone%%% -inductive activity. The results of the %%%purification%%% of BMP with ion exchange HPLC indicate the possibility that more than two proteins (Mr. 18,000 or others) may have the BMP activity. The materials for the carrier of BMP can enhance the BMP activity, if they can provide the microenvironment which is suitable for cell differentiation and can act as the delivery system for BMP. And if we can obtain them easily like the skin atelocollagen or hydroxyapatite, they are very significant clinically.

2/7/227 (Item 26 from file: 5)
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08532785 BIOSIS NO.: 198783011676
ORIENTATION OF GINGIVAL FIBROBLASTS IN SIMULATED PERIODONTAL SPACES IN-VITRO SCANNING ELECTRON MICROSCOPIC OBSERVATIONS
AUTHOR: AUKHIL I (Reprint); FERNYHOUGH W S
AUTHOR ADDRESS: DEP PERIODONTICS, UNIV NORTH CAROLINA SCH DENTISTRY, CHAPEL
HILL, NC 27514, USA**USA
JOURNAL: Journal of Periodontology 57 (7): p405-412 1986
ISSN: 0022-3492
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: The present study examined the orientation of gingival fibroblasts in simulated periodontal spaces in vitro. Extracted human teeth were root planed followed by root resection and root canal instrumentation. The middle and cervical thirds of each root were cut transversely to create 600-.mu.m thick sections. Cortical bovine %%%bone%%% was cut, sectioned and contoured to create %%%bone%%% rings 600 .mu.m thick with an internal diameter large enough to accommodate a root slice leaving a circumferential space varying from approximately 0.1 to 1.0 mm. Root slices and %%%bone%%% rings were incubated in a solution of collagenase and hyaluronidase to remove all remaining soft tissue and partially %%%demineralized%%% in EDTA (18%) for 30 minutes. Human gingival fibroblasts (HGF) were plated to confluency in tissue culture dishes. The dentin slices were then gently placed over the HGF monolayer along with %%%bone%%% rings around them to create simulated periodontal spaces. Control root slices were placed without %%%bone%%% rings around them. Cultures were maintained under standard tissue culture conditions. Representative specimens were obtained after 2, 3 and 4 weeks of culture and processed for scanning electron microscopy (SEM). At 2 weeks, the HGF had formed sheets of cells attached to the periphery of the root slices at one end and to the inner surface of %%%bone%%% rings at the other end. The orientation of cell sheets varied from being perpendicular to the periphery of the slice to oblique. At 3 and 4 weeks, the density and size of cell sheets increased and the orientation was maintained. The control root slices at the different observation periods showed cell attachment around the periphery of root slices but the cell sheets were seen only on %%%isolated%%% spots and were smaller in size compared to the experimentals. The present findings suggest that the spatial relationship of substrata (root and %%%bone%%%) can influence the orientation of cells. The present in vitro model appears to be suitable to study the development of oriented fibers in simulated periodontal spaces.

2/7/228 (Item 27 from file: 5)
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08134978 BIOSIS NO.: 198681098869
%%%ISOLATION%%% AND KINETIC PROPERTIES OF AN ALKALINE PHOSPHATASE FROM RAT
%%%BONE%%% MATRIX-INDUCED CARTILAGE
AUTHOR: CURTI C (Reprint); PIZAURO J M; ROSSINHOLI G; VUGMAN I; OLIVEIRA J

A M D, LEONE F A
AUTHOR ADDRESS: DEPARTAMENTO DE QUIMICA-FACULDADE DE FILOSOFIA CIENCIAS E
LETRAS-USP 14100 RIBEIRAO PRETO, SAO PAULO, BRAZIL**BRAZIL
JOURNAL: Cellular and Molecular Biology (Oxford) 32 (1): p55-62 1986
ISSN: 0145-5680
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: Alkaline phosphatase, obtained from rat %%%bone%%% matrix-induced cartilage 14 days after the implantation of %%%demineralized%%% %%%bone%%% particles, was %%%purified%%% by column chromatography on Sepharose 4B. The %%%purified%%% membrane-bound enzyme showed optimal activity for PNPP** at pH 9.4 and maximal specific activity of 550 nmoles min-1mg-1. Km values for PNPP were 0.1 mM and in the range between 0.013 and 1 mM no substrate inhibition was observed. Thermal inactivation studies revealed values of 10.6 kcal mol-1 for the enthalpy of activation for PNPP hydrolysis and no break on the Arrhenius plot. The modulating effects of zinc, cobalt, magnesium and calcium were investigated and the data suggest that the metal sites are non-specific despite the fact that cooperative effects were observed. Maximum enhancements obtained were 14.8, 15.8, 35.8 and 37.2 for zinc, calcium, cobalt and magnesium, respectively. The stoichiometry and the metal-enzyme association was 2.0, 2.5, 5.0 and 6.5 .mu.mol of metal/mg of protein for zinc, calcium, magnesium and cobalt, respectively.

2/7/229 (Item 28 from file: 5)
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07737824 BIOSIS NO.: 196580046719
AN EXPERIMENTAL STUDY ON CARTILAGE AND MORPHOGENESIS INDUCED BY IMPLANTATION OF %%%DEMINERALIZED%%% DENTIN MATRIX
AUTHOR: YAHAGI S (Reprint)
AUTHOR ADDRESS: DEP PATHOLOGY, TOKYO DENTAL COLL, CHIBA 260, JAPAN**JAPAN
JOURNAL: Shikwa Gakuho 65 (2): p135-165 1965
ISSN: 0037-3710
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: JAPANESE

ABSTRACT: Alterations in the %%%bone%%%-inductive principle of dentin treated with solutions of CaCl2, EDTA, LiCl, and collagenase after demineralization and mechanisms of cellular differentiation in chondrogenesis and osteogenesis induced by implantation of %%%demineralized%%% dentin matrices were studied. Mandibular and maxillary incisors were extracted from adult rats and sectioned into halves. Pulp tissues were removed from their pulp chambers. Fragments of dentin were %%%isolated%%% from periodontal ligaments, cementum, and %%%bone%%% to the maximum extent and were %%%demineralized%%% with 0.6 N HCl; %%%demineralized%%% with 0.6 N HCl followed by 2 M CaCl2, 0.5 M EDTA, and 6 M LiCl and incubated with a 0.01% solution of collagenase. Treated dentin matrices were implanted into the muscle of the anterior abdominal wall and beneath the kidney capsule of homogeneous animals, and examined with light microscopy and EM. Dentin matrices from all 3 groups induced cartilage and %%%bone%%% formation in muscle tissue. Responsibility of induction in the shot cells, however, resulted in distinct differences in time and quantity. Cells of the last group demonstrated the most prominent inductive properties. After the 3rd day of implantation, slight proliferation of fibroblasts and endothelial cells and degenerative changes of muscle cells could be detected in regions adjacent to dentin matrices homografted into the muscle. From the 7th-14th days, chondroblastic activity peaked and %%%bone%%% formation was detected in places where vascular invasion had occurred. Development of hematopoetic %%%bone%%% marrow was obvious on the 21st day after implantation. In some cases, dentin matrices revealed complicated figures of both new %%%bone%%% formation and resorption by multinuclear giant cells. By day 21 after implantation, neither %%%bone%%% nor cartilage had been produced in dentin matrices implanted beneath the kidney capsule. All these dentin matrices were encapsulated by fibrous connective tissues. Three factors may participate in induction: a %%%demineralized%%% dentin matrix, including inductive protein (BMP) and a microenvironment: cellular activity of the host tissue; and O2 supply through new blood vessels. Mesenchymal cells can be differentiated into chondroblasts in < 5 days under the influences of the microenvironment. Hypertrophy of chondrocytes and calcification of the cartilage matrix could be detected in the region where vascular invasion was evident. New %%%bone%%% matrix and %%%bone%%% marrow formation was discernible. The processes of cellular differentiation seem similar to those occurring in the endochondral ossification observed in long bones. Mesenchymal cells may differentiate into fibroblasts when host tissues have low cellular activity or when the microenvironment cannot be equipped with a dentin matrix. When the dentin matrix has been absorbed by multinuclear giant cells, osteoblasts may be differentiated directly from mesenchymal cells closely associated with vascular invasions. This process seems analogous to that occurring in membrane ossification.

2/7/230 (Item 29 from file: 5)
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07273337 BIOSIS NO.: 198478006744
MATRIX GAMMA CARBOXY GLUTAMIC-ACID PROTEIN A NEW GAMMA CARBOXY GLUTAMIC-ACID CONTAINING PROTEIN WHICH IS ASSOCIATED WITH THE ORGANIC
MATRIX OF %%%BONE%%%
AUTHOR: PRICE P A (Reprint); URIST M R; OTAWARA Y
AUTHOR ADDRESS: DEP BIOL, UNIV CALIFORNIA, SAN DIEGO, LA JOLLA, CALIF 92093, USA**USA
JOURNAL: Biochemical and Biophysical Research Communications 117 (3): p 765-771 1983
ISSN: 0006-291X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: A new protein was %%%isolated%%% from CaCl2/urea extracts of %%%demineralized%%% bovine %%%bone%%% matrix. This protein has 5-6 residues of the vitamin K-dependent amino acid, gamma.-carboxyglutamic acid (Gla), and it was designated matrix Gla protein. Matrix Gla protein is a 15,000 dalton protein whose amino acid composition includes a single disulfide bond. The absence of 4-hydroxyproline in matrix Gla protein demonstrates that it is not a precursor to %%%bone%%% Gla protein, 5500 dalton protein which has a residue of 4-hydroxyproline at position 9 in its sequence. Matrix Gla protein also does not cross-react with antibodies raised against %%%bone%%% Gla protein.

2/7/231 (Item 30 from file: 5)
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07176731 BIOSIS NO.: 198477009842
IDENTIFICATION OF A %%%BONE%%% MATRIX DERIVED CHEMOTACTIC FACTOR
AUTHOR: SOMERMAN M (Reprint); HEWITT A T; VARNER H H; SCHIFFMANN E; TERMINE
J; REDDI A H
AUTHOR ADDRESS: CLIN INVEST PATIENT CARE BRANCH, NATL INST DENT RES, BETHESDA, MD 20205, USA**USA
JOURNAL: Calcified Tissue International 35 (4-5): p481-485 1983
ISSN: 0171-967X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: When %%%demineralized%%% %%%bone%%% matrix powder is implanted

subcutaneously in the rat, the early responses involve the appearance and proliferation of mesenchymal cells at the site of implantation, followed by cartilage and %%%bone%%% formation. The ability of cells to migrate to the implant suggests that chemotaxis may be a critical event in this process. Therefore, using the modified Boyden chamber assay, extracts of %%%demineralized%%% %%%bone%%% matrix were tested for chemotactic activity. On molecular sieve chromatography, a heat labile and trypsin-sensitive protein (Mr = 60,000-70,000) that is a potent chemoattractant for mouse calvaria, osteoblast-like cells (MMB-1), but not for monocytes (putative osteoclast precursors) was identified and partially %%%purified%%%. Chemotactic protein(s) apparently have a significant role in the recruitment of osteoprogenitor cells to a site of %%%bone%%% repair.

2/7/232 (Item 31 from file: 5)
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06986382 BIOSIS NO.: 198376077817
HUMAN %%%BONE%%% MORPHOGENETIC PROTEIN
AUTHOR: URIST M R (Reprint); SATO K; BROWNELL A G; MALININ T I; LIETZE A; HUO Y-K; PROLO D J; OKLUND S; FINERMAN G A M; DELANGE R J
AUTHOR ADDRESS: UCLA BONE RES LAB, LOS ANGELES, CA 90024, USA**USA
JOURNAL: Proceedings of the Society for Experimental Biology and Medicine 173 (2): p194-199 1983
ISSN: 0037-9727
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: Human %%%bone%%% morphogenetic protein (hBMP) was chemically extracted from %%%demineralized%%% gelatinized cortical %%%bone%%% matrix by means of a CaCl2.cntdot.urea inorganic-organic solvent mixture, differential precipitation in guanidine hydrochloride, and preparative gel electrophoresis. hBMP is %%%isolated%%% in quantities of 1 mg/kg of wet weight of fresh %%%bone%%%, and has the amino-acid composition of an acidic polypeptide. The MW is 17-18 kDa (kilodaltons). Implants of the %%%isolated%%% 17-kDa protein are very rapidly adsorbed and produce a smaller volume of %%%bone%%% than protein fractions consisting of 24-, 17-, and 14-kDa proteins. Since the %%%isolated%%% 24- and 14-kDa components lack hBMP activity, the kinetics of the %%%bone%%% morphogenetic processes, including the function of other proteins as carrier molecules, await investigation.

2/7/233 (Item 32 from file: 5)
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06338003 BIOSIS NO.: 198172071954
CHONDROITIN SULFATE FROM FOSSILIZED ANTLERS
AUTHOR: SCOTT J E (Reprint); HUGHES E W
AUTHOR ADDRESS: DEP OF MED BIOCHEMISTRY, UNIV OF MANCHESTER MED SCHOOL, OXFORD ROAD, MANCHESTER M13 9PT, UK**UK
JOURNAL: Nature (London) 291 (5816): p580-581 1981
ISSN: 0028-0836
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: If biopolymers could be %%%isolated%%% from archaeological specimens there would be good prospects of correlating the gene products from different populations of the same species, for example, according to their immunological specificities. Soft tissues are very poorly preserved after only decades, but the macroscopic appearance of %%%bone%%% and antler can remain unchanged for thousands of years. Methods which allow the extraction of relatively undegraded biopolymers from such materials would extend by several orders of magnitude the period from which biopolymers could be identified. Chondroitin sulfate, a polysaccaride characteristic of connective tissue and with chemical similarities to immunologically active glycosaminoglycans, was %%%isolated%%% in good yield from fossilized antlers [Cervus elaphus, Rangifer tarandus, and Megaceros giganteus] (3000-130,000 yr old) which were %%%demineralized%%% by a new procedure. There are now prospects for using biochemical and immunological methods in situ and and on %%%isolated%%% biopolymers to investigate the composition and mobility of populations of species in the past.

2/7/234 (Item 33 from file: 5)
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06330512 BIOSIS NO.: 198172064463
ROLE OF FIBRONECTIN IN COLLAGENOUS MATRIX INDUCED MESENCHYMAL CELL PROLIFERATION AND DIFFERENTIATION IN-VIVO
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JOURNAL: Experimental Cell Research 133 (2): p247-254 1981
ISSN: 0014-4827
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: The importance of fibronectin in in vivo collagenous matrix-mesenchyme cell interaction was investigated using %%%purified%%% antibodies to rat plasma fibronectin. Subcutaneous implantation of %%%demineralized%%% %%%bone%%% matrix normally resulted in de novo local endochondral ossification. Local injections of the %%%purified%%% antibodies apparently inhibited collagenous matrix-mesenchyme cell interaction by inhibiting the action of endogenous fibronectin. Anti-fibronectin treatment resulted in reduced cell proliferation as assessed by [3H]thymidine incorporation (59%, reduction) and ornithine decarboxylase activity (66%, reduction) and chondrogenesis as measured by proteoglycan synthesis (43%, reduction). Neutralization of fibronectin's biological activity by antibodies resulted in a qualitative change in the proteoglycan type synthesized. The physiological role of fibronectin in tissue morphogenesis appears to allow for initial extracellular matrix-cell attachment.

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06010319 BIOSIS NO.: 198070041806
SYNTHESIS AND LOCALIZATION OF FIBRONECTIN DURING COLLAGENOUS MATRIX MESENCHYMAL CELL INTERACTION AND DIFFERENTIATION OF CARTILAGE AND %%%BONE%%% IN-VIVO
AUTHOR: WEISS R E (Reprint); REDDI A H
AUTHOR ADDRESS: LAB BIOL STRUCT, NATL INST DENT RES, BETHESDA, MD 20205, USA**USA
JOURNAL: Proceedings of the National Academy of Sciences of the United States of America 77 (4): p2074-2078 1980
ISSN: 0027-8424
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: The biosynthesis of fibronectin during the in vivo development of matrix-induced endochondral %%%bone%%% was investigated by using [35S]methionine in rats. The %%%demineralized%%% %%%bone%%% matrix that was implanted s.c. to induce local %%%bone%%% formation bound circulating fibronectin. This may be an important initial requirement for cell attachment to the matrix. Fibronectin was present throughout the

development of %%%bone%%% but accounted for the largest percentage of total protein synthesized during mesenchymal cell proliferation and hematopoiesis. Fibronectin was identified in tissue extracts by its comigration on electrophoretic NaDodSO4[sodium dodecylsulfate]/polyacrylamide gels with human and rat plasma fibronectin, affinity for denatured collagen, crossreactivity with %%%purified%%% antibody of rat plasma fibronectin and insensitivity to collagenase digestion. Fibronectin was localized by immunofluorescence in the extracellular matrix during the period of mesenchymal cell proliferation. During chondrogenesis fibronectin was demonstrated in the differentiating chondrocytes. Fibronectin was detectable in the cartilage matrix only after hyaluronidase treatment. During vascular invasion, prior to osteogenesis, fibronectin was localized in association with endothelial cells. Fibronectin may play a role in collagenous matrix-mesenchymal cell interaction in vivo.

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05941650 BIOSIS NO.: 198069055637
DISTRIBUTION OF LIPIDS ASSOCIATED WITH MINERALIZATION IN THE BOVINE EPIPHYSEAL GROWTH PLATE
AUTHOR: BOSKEY A L (Reprint); POSNER A S; LANE J M; GOLDBERG M R; CORDELLA
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JOURNAL: Archives of Biochemistry and Biophysics 199 (2): p305-311 1980
ISSN: 0003-9861
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: Calcium-acidic phospholipid-phosphate complexes, known to induce in vitro hydroxyapatite formation from metastable calcium phosphate solutions, were %%%isolated%%% from the morphologically defined zones of bovine epiphyseal growth plate. The changes in zonal distribution of these complexes in epiphyseal cartilage correlate directly with other biochemical changes occurring prior to cartilage calcification. The concentration of calcium-acidic phospholipid-phosphate complexes increases going from the morphologically defined reserve zone to the proliferative zone, peaking in the hypertrophic zone, where mineralization is initiated, and decreasing in primary spongiosa and diaphyseal %%%bone%%%. Expressed as mg of Ca-phospholipid-phosphate complex per mg hydroxyproline, the concentration ranged from 19 (articular cartilage) to 535 (hypertrophic cell zone) decreasing to 43 (diaphyseal %%%bone%%%) with parallel changes occurring when the concentration was expressed per gram of %%%demineralized%%% dry tissue, per total lipid, per DNA or per 5'-AMPase activity.

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05934777 BIOSIS NO.: 198069048764
DETECTION OF COLLAGEN DEGRADATION PRODUCTS FROM SUB CUTANEOUSLY IMPLANTED
ORGANIC %%%BONE%%% MATRIX
AUTHOR: YAKAGI Y (Reprint); KUBOKI Y; SASAKI S
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JOURNAL: Calcified Tissue International 28 (3): p253-258 1979
ISSN: 0171-967X
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: %%%Demineralized%%% bovine %%%bone%%% powder was reduced with NaB3H4 to label the collagen crosslinks with tritium. The powder was enclosed in small nylon mesh pouches and implanted subcutaneously into rats for 3 wk. Histological examinations revealed that multinuclear giant cells accumulated around the %%%bone%%% matrix, some in Howship's lacunae. Collagenous peptides containing intermolecular crosslinks were detected in the urea-soluble fraction extracted from the implant. Two crosslink-containing peptides were %%%isolated%%% from a dialyzable fraction; 1 contained dihydroxylysinonorleucine, the other, hydroxylysinonorleucine. Both peptides had MW of approximately 1000 estimated from the elution positions of gel filtration chromatography; both had similar quantitative compositions of amino acids. There were no homologous peptides detected in a control experiment of the reduced %%%bone%%% matrix incubated in vitro with buffered saline for 1 wk at 37.degree. C.

2/7/238 (Item 37 from file: 5)
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05432827 BIOSIS NO.: 197866019311
CHANGES IN PROTEO GLYCAN TYPES DURING MATRIX INDUCED CARTILAGE AND %%%BONE%%% DEVELOPMENT
AUTHOR: REDDI A H (Reprint); HASCALL V C; HASCALL G K
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JOURNAL: Journal of Biological Chemistry 253 (7): p2429-2436 1978
ISSN: 0021-9258
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: ENGLISH

ABSTRACT: S.c. implantation of %%%demineralized%%% %%%bone%%% matrix powder in rats induces migration of host cells into the site and results in a sequential chondrogenic-osteogenic development. The proteoglycans synthesized in these subcutaneous piaques at different stages during this sequence were labeled in vivo with [35S]sulfate and then %%%isolated%%% using associative and dissociative extractions followed by density gradient centrifugation. The predominant proteoglycan synthesized by Day 7 plaques, when cartilage formation is maximal, has similar elution profiles on Sepharose 2B to proteoglycans %%%isolated%%% from rat femoral head cartilage. The proteoglycans from both of these cartilages contain 95% chondroitin 4-sulfate, very little keratan sulfate, and form aggregates. The chondroitin sulfate chains from the Day 7 plaque proteoglycans are somewhat larger. On Day 9, prior to osteogenesis, the hypertrophied cartilage matrix undergoes extensive calcification. At this time, there is a decline in synthesis of cartilage-type proteoglycan and the appearance of a smaller size proteoglycan which increases further on days 11-14, when the plaques contain primarily osteogenic cells. The smaller %%%bone%%%-type proteoglycan has larger chondroitin sulfate chains than in the cartilage proteoglycans. Autoradiography of 35S-labeled plaques provided evidence that osteoblasts and osteocytes are the sites of synthesis of %%%bone%%%-type proteoglycan. A small proteoglycan with very similar characteristics is also synthesized on Day 4 by pre-chondrogenic plaques. An associative extraction procedure employing 0.5 M guanidine .cntdot. HCl and protease inhibitors was developed to extract proteoglycans in aggregated form from the plaques. The effectiveness of this procedure for extracting proteoglycans from the femoral head and xiphosternum cartilages was also studied.

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0001842401 BIOSIS NO.: 19684900001041
Fractionation of the acid-soluble nitrogen of %%%bone%%% and dentine

AUTHOR: LEAVER A G G; SHUTTLEWORTH C A
AUTHOR ADDRESS: Sch. Dent. Surg., Univ. Liverpool, Engl., UK
JOURNAL: ARCH ORAL BIOL 12 ((8)): p947-958 1967 1967
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: Unspecified

ABSTRACT: The proportion of the total nitrogen of ox %%%bone%%% and human dentine soluble in N HCl at 2[degree] C was estimated and the material fractionated by gel filtration and ion-exchange chromatography. Sawn discs of %%%bone%%% were split into fragments in a percussion mill, while root dentine was prepared with the minimum of grinding necessary to remove cementum and pulp. %%%Bone%%% fragments and dentine "roots" were %%%demineralized%%% without further mechanical treatment. . Under these conditions 3.7% of %%%bone%%% nitrogen and 4.3% of that of dentine went into solution. The large-molecular fractions contained very little soluble collagen and included only a small proportion of the non-collagenous components known to be present in %%%bone%%%, while the corresponding fractions from dentine comprised only one quarter of the total acid soluble nitrogen. The small-molecular fractions, consisting of peptides and only minimal traces of free amino acids, comprised 11% of the soluble nitrogen of %%%bone%%% and 27% of that of dentine. Acid demineralization, under the standard conditions described, was found to be perfectly adequate and very convenient for the %%%isolation%%% of these peptide fractions but unsuitable for the %%%isolation%%% of the compounds of larger molecular size.[long dash]Authors.

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0001744154 BIOSIS NO.: 19674800028158
Study of proteins and glyco-proteins in the compact bones of the rabbit [Engl. and Ger. summ.]
ORIGINAL LANGUAGE TITLE: Etude des proteines et glyco-proteides de l' os compact du lapin [Engl. and Ger. summ.]
AUTHOR: BURCKARD J; HAVEZ R; DAUTREVAUX M
AUTHOR ADDRESS: Fac. Mixte Med. Pharm., Lille, France
JOURNAL: BULL SOC CHIM BIOL 48 ((7)): p851-861 1966 1966
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: Unspecified

ABSTRACT: The compact %%%bone%%% of rabbit %%%demineralized%%% in a neutral medium by the disodic salt of ethylenediaminetetraacetate (EDTA) liberates a rotein and glyco-protein fraction representing 6 or 7 p/100 of the total organic matrix. Serumalbumin and glycoproteins of plasma origin (about 35 p/100), [alpha]1-glycoprotein (30 pAOO), a sialoglycoprotein 24 pAOO) and 12 p/100 of acid mucopolysaccharides were identified. The sialoglycoprotein %%%isolated%%% by chromatography on diethylaminoethyl (DEAE) cellulose migrates during electrophoresis at the level of [alpha]1-globulins; it contains 23 p/100 of combined carbohydrates, its polypeptide fraction is very rich in glutamic and aspartic acids. The mucopolysaccharides %%%isolated%%% by fractionation in the presence of cetylpyridinium chloride correspond to a minor fraction of hyaluronic acid and chondroitin-sulfates. The insoluble residue after demineralization does not liberate any acid-soluble collagen fraction. It contains 18.4 p/100 of N, and may be considered as identical with %%%bone%%% collagen by its amino-acid composition. ABSTRACT AUTHORS. Authors

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0001715958 BIOSIS NO.: 19664700120064
The %%%isolation%%% and amino acid composition of the %%%bone%%% collagen in Pleistocene mammals

AUTHOR: HO TONG-YUN
AUTHOR ADDRESS: Dep. Phys., Univ. Ariz., Tucson, Ariz., USA
JOURNAL: COMP BIOCHEM PHYSIOL 18 ((2)): p353-358 1966 1966
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: Unspecified

ABSTRACT: The %%%bone%%% collagens in 7 different species of Pleistocene mammals (ground sloth, gopher, dire wolf, saber-tooth cat, unidentified ungulate, western camel and western horse) were analyzed for their amino acid compositions. Approximately 70% of %%%demineralized%%% pre-teinaceous matter in compact bones and 13% in spongy bones were recovered as "pure" collagen by treatment of the %%%demineralized%%% %%%bone%%% with CaCl2 solution. A higher yield of ca. 90% was obtained when the demineraflzed matter from compact %%%bone%%% was treated with neutral buffer solutions. With the exception of higher amounts of alanine and smaller amounts of hydroxyproline in the ground sloth and the saber-tooth cat, amino acids are present in similar amounts in the fossil collagens and in those from modern mammals, but such minor differences may be significant. For the extinct ground sloth and saber-tooth cat, the amino acid composition resembles that of certain lower vertebrates with larger amounts of alanine and reduced amounts of hydroxyproline. The amino acid composition of the collagen of the extinct western horse differs from that of the Recent horse only in having a low histidine content. ABSTRACT AUTHORS: Author

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0001216822 BIOSIS NO.: 19623600014495
Zinc requirement of the chick: Factors affecting requirement
AUTHOR: ZEIGLER T R; LEACH R M; NORRIS L C; SCOTT M L
AUTHOR ADDRESS: Cornell Univ., Ithaca, N. Y.
JOURNAL: POULTRY SCI 40 ((6)): p1584-1593 1961 1961
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: Unspecified

ABSTRACT: %%%Purified%%% diets containing either %%%isolated%%% soybean protein or casein protein were used to determine the zinc requirement of the 4 week old chick. Chicks raised under zinc-free conditions and fed these diets and %%%demineralized%%% water exhibited severe deficiency symptoms including retarded growth, decreased efficiency of feed utilization, abnormal %%%bone%%% development, poor feathering and a dermatosis of the stratified squamous epithelium. Regressions of 4 week weight vs. log dose of dietary Zn were calculated by the method of least squares and the calculated intercept of each line with maximum response line was taken as the requirement within an experiment. The requirement of chicks for total dietary zinc fed casein diets was 12-14 mg/kg or 21.0-22.0 [mu]g/gm gain, and 27-29 mg/kg or 48.1-48.5 when %%%isolated%%% soybean protein diets were fed. Increasing the level of dietary corn oil from 3 to 10% caused an increase in the requirement only when %%%isolated%%% soybean diets were fed. Since the change did not occur with the casein diets, it is felt that the increased requirement was due to the simultaneous increase in the level of %%%isolated%%% soybean protein. A significant growth increase was obtained when 100 ppm Zn was added to practical type diets. Zinc analytical values are given for 17 dietary ingredients. ABSTRACT AUTHORS: T. R. Zeigler

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0001021313 BIOSIS NO.: 19630500003757
Calcification .XXH A method of studying crystal growth
AUTHOR: SAMACHSON JOSEPH; NOBEL SIDNEY; SOBEL ALBERT E
AUTHOR ADDRESS: Jewish Hosp., Brooklyn, N. Y.

JOURNAL: JOUR DENTAL RES 38 ((2)): p253-261 1959 1959
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: Unspecified

ABSTRACT. %%%Demineralized%%% rachitic %%%bone%%% section treated with 75 m[image]/l CaCl2, will not mineralize in contrast to untreated sections. When such treatment is followed by phosphate treatment, 16.8 mM/l or higher, the %%%demineralized%%% %%%bone%%% sections will mineralize at a rapid rate as measured by increase in Ca and P content and can be visualized by means of the silver staia The initial molar Ca/P ratio following preliminary Ca and PO4-treatment was found to be as low as 0.17. Upon further mineralization this was found to rise to the apatite Ca/P range and X-ray analysis confirmed the presence of apatite. The mineralization of such "nucleated sections" takes place at products as low as Ca x P = 18 to correspond to the mineralization obtained with a Ca x P = 45 for fresh rachitic sections. Such nucleated sections may be useful in studying crystal growth as the crystals may be readily %%%isolated%%% from the solution. When inorganic seed crystals are directly utilized, changes take place during filtration due to loss of CO2 by the solution. The crystal growth in such sections may also be studied when transplanted under the skin. Crystals growing in organic matrix resemble the phenomena closer to the in vivo process than simple organic systems. When only qualitative experiments are desired, the rapid silver stain serves as a ready guide. This method was employed in showing the inhibition of crystal growth by means of Be. This inhibition with 0.1 m[image]/l to 1.0 m[image]/l Be in the presence of 75 mM/l Ca was reversed by subsequent treatment with 50 m[image]/l phosphate, but was not reversed when Be treatment took place in the absence of Ca. Ca3(PO4 2 seeds behave in a manner analagous to that of nucleated sections with respect to Be inhibition. The binding of Be is proposed as a model of the manner in which cessation of crystal growth is achieved. ABSTRACT AUTHORS: S. Nobel and A. E. Sobel

2/7/244 (Item 1 from file: 73)
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0081855014 EMBASE No: 2007289173
%%%Demineralized%%% bovine cancellous %%%bone%%% combined with stem cell transplantation in repair of femoral defects in rabbits
Ma G.-L.; Li S.Q.; Yang S.L.; Huang J. // Li G. // Bai R.G.
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Journal of Clinical Rehabilitative Tissue Engineering Research (J. Clin. Rehab. Tissue Eng. Res.) (China) March 11, 2007, 11/10 (1822-1825) ISSN: 16738225
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: Chinese SUMMARY LANGUAGE: English; Chinese
NUMBER OF REFERENCES: 20

Aim: To observe the repair of rabbit femoral long %%%bone%%%-periosteum defects by marrow mesenchymal stem Pells (MSCs) combined with %%%demineralized%%% bovine cancellous %%%bone%%% (DBCB) and the feasibility of repairing loaded %%%bone%%% defects. Methods: The experiment was performed at the Central Laboratory of Harbin Medical University from September 2002 to October 2003. (1) The MSCs were %%%isolated%%% from autologous %%%bone%%% marrow of twenty-four healthy adult New Zealand white rabbits. The second generation MSCs 5 x 10 SUP.8 L SUP.-1 was mixed with DBCB, and then 6-8 mL air was absorbed from centrifuge tube by injection syringe to establish underpressure artificially, cultured for 4 hours. Cells entered DBCB pore to make into MSCs compound. (2) The rabbit model of 10 mm %%%bone%%%-periosteum defects was made in the middle of bilateral femur and fixed with plate and screw. Twenty of the rabbits were selected randomly, with composite planted on the right side as the experimental group and DBCB planted on the left side as the control group, the other four rabbits become the blank group without any materials planted into both sides of %%%bone%%% defects. (3) General observation and %%%bone%%% mineral density (BMD) measurement were performed, and the repairing ability in %%%bone%%% defects was compared each time point at weeks 8, 12, 16 and 24 (5 rats in both groups, respectively). Results: (1) general observation of repairing sample of each group: There was partial repair of %%%bone%%% defect at week 8, full repair at weeks 12 and 16 in the experimental group. A few new bones appeared at week 8; implant was replaced by new bones partially, and there was bad formation at %%%bone%%% defects at weeks 12 and 16. %%%Bone%%% defect was not repaired in the blank group. (2) BMD in the two groups: It was larger in the experimental group than the control group a t weeks 8, 12 and 16 (0.9360.056 vs. 0.6180.034,1.2380.024 vs. 1.0520.037,1.6050.062 vs. 1.2270.047, P < 0.05). There was no statistical difference between the experimental group and control group at week 24 (1.6350.033,1.563 0.112, P > 0.05). Conclusion: The early defect repairing ability of tissue engineering %%%bone%%% constructed by MSCs is strong, and compared with DBCB alone, the osteogenicity is enormous and rapid, so the cells can effectively repair defects of loaded bones.

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0081777663 EMBASE No: 2007211663
Quantification of various growth factors in different %%%demineralized%%% %%%bone%%% matrix preparations
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Journal of Biomedical Materials Research - Part A (J. Biomed. Mater. Res. Part A) (United States) May 1, 2007, 81/2 (437-442)
CODEN: JBMRC ISSN: 15493296 eISSN: 15524965
DOI: 10.1002/jbm.a.31085
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English SUMMARY LANGUAGE: English
NUMBER OF REFERENCES: 28

Besides autografts, allografts, and synthetic materials, %%%demineralized%%% %%%bone%%% matrix (DBM) is used for %%%bone%%% defect filling and treatment of non-unions. Different DBM formulations are introduced in clinic since years. However, little is known about the presents and quantities of growth factors in DBM. Aim of the present study was the quantification of eight growth factors important for %%%bone%%% healing in three different "off the shelf" DBM formulations, which are already in human use: DBX putty, Grafton DBM putty, and AlloMatrix putty. All three DBM formulations are produced from human donor tissue but they differ in the substitutes added. From each of the three products 10 different lots were analyzed. Protein was extracted from the samples with Guanidine HCL/EDTA method and human ELISA kits were used for growth factor quantification. Differences between the three different products were seen in total protein content and the absolute growth factor values but also a large variability between the different lots was found. The order of the growth factors, however, is almost comparable between the materials. In the three investigated materials FGF basic and BMP-4 were not detectable in any analyzed sample. BMP-2 revealed the highest concentration extractable from the samples with (similar) 3.6 mug/g tissue without a significant difference between the three DBM formulations. In DBX putty significantly more TGF-beta1 and FGFa were measurable compared to the two other DBMs.

1GF-I revealed the significantly highest value in the AlloMatrix and PDGF in Grafton. No differences were accessed for VEGF. Due to the differences in the growth factor concentration between the individual samples, independently from the product formulation, further analyzes are required to optimize the clinical outcome of the used %%%demineralized%%% %%%bone%%% matrix. (c) 2006 Wiley Periodicals, Inc.

2/7/246 (Item 3 from file: 73)
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0081130130 EMBASE No: 2006192000
Experimental study on the tissue-engineered %%%bone%%% constructed by %%%bone%%% marrow-derived osteoblasts of rabbits and decalcified %%%bone%%% matrix of human to repair %%%bone%%% defect
Wang Y.-X.; Bi Z.-G.; Yang C.-L. // Sun M.-X.; Tang P.-F.
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Chinese Journal of Clinical Rehabilitation (Chin. J. Clin. Rehab.) (China) February 10, 2006. 10/5 (7-9)
CODEN: ZLKHA ISSN: 16715926
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: Chinese SUMMARY LANGUAGE: English; Chinese
NUMBER OF REFERENCES: 7

Aim: To observe feasibility of tissue-engineered %%%bone%%% constructed by %%%bone%%% marrow derived osteoblast of rabbits and %%%demineralized%%% %%%bone%%% matrix (DBM) and %%%bone%%% defect repair. Methods: The experiment was conducted at the Animal Laboratory Center, First Clinical Medicine College, Harbin Medical University between March 2004 and January 2005. 1 Thirty-six Japanese flap-eared rabbits (no matter male or female) were divided into 2 groups randomly: experimental group and control group with 18 rabbits in each group divided randomly into 3 secondary groups with 6 rabbits in each subgroup for 4 weeks group, 8 weeks group and 12 weeks group. Three other rarebits were selected as blank control group. 2 2.0 ml %%%bone%%% marrow were extracted at tibial tubercle, %%%isolated%%%, cultured, and induced to cell differentiation. %%%Bone%%% marrow derived from osteoblast grew well and DBM were selected to construct tissue-engineered %%%bone%%% at the right moment functional status. Cell attach, growth and multiplication in bracket pore were observed by scanning electron microscope after 24 hours, 48 hours and 72 hours. 3 Animal experimental models were made with periosteal %%%bone%%% defect of right radial intermediate piece for 1.5 cm, and tissue-engineered %%%bone%%% was replanted in the experimental group and cradle of DBM in the control group. The capabilities of %%%bone%%% defect repair, vascularization, and ossification were studied with X-ray, in general observation and histology at 4, 8 and 12 weeks. Results: 1 Cells attached to the wall well in bracket pore after 24 hours when %%%bone%%% marrow derived from osteoblast of rabbits and DBM combined. A few of the cells piled up the conglobation; all cells almost attached to the wall and excreted collagen almost after 48 hours, all of the cells attached to the wall after 72 hours and completely expanded, connected by prominence presented in flanking cells, disposited uniformity, increased on number, excreted much collagen. 2 After 12-week operation, X-ray was stopped significantly in the experimental group. The part of %%%bone%%% defect was made a statue completely. Medullary cavity of %%%bone%%% had been recanalization. The X-ray was stopped by cradle resistance stronger, and the two sides had been healing, and began to make a statue in the control group. There was no X-ray resistance and no osteoblast in the blank control group after operation. 3 Ossification quantity and numbers of new vessels increased gradually along with time changed in the experimental group and control group, but those increased vale in the experimental group at 4, 8 and 12 weeks were higher than that in the control group [(2.0680.216)% vs (0.5320.102)%, (2.9760.304)% (1.3020.354)%, (3.7080.382)% vs (2.2460.402)%, P <0.05]. Conclusion: There is well biocompatibility between %%%bone%%% marrow derived osteoblast of rabbits and DBM of human. Bracket provides good three-dimension for cell growth. The tissue-engineered %%%bone%%% construction with %%%bone%%% marrow derived osteoblast of rabbits and DBM of human is feasibility and has repaired the %%%bone%%% defect well.

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0079991534 EMBASE No: 2004176684
A simple and useful method for evaluating biocompatibility of titanium alloy with heterotopic %%%bone%%% induced by %%%demineralized%%% %%%bone%%% matrix (DBM) pellet in mice
Arai M.; Nagasawa T., Tsunashima Y.; Matsuda T.; Kawamura H., Mogi M., Togari A.
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Oral Therapeutics and Pharmacology (Oral Ther. Pharmacol.) (Japan) December 1, 2003. 22/3 (117-126)
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DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English SUMMARY LANGUAGE: English; Japanese
NUMBER OF REFERENCES: 28

Titanium (Ti) and Ti alloys are widely used for dental materials. Recently, an aluminium and vanadium free titanium alloy, Ti-29Nb-13Ta-4.6Zr alloy, was developed. In the present study, we used the %%%demineralized%%% %%%bone%%% matrix (DBM) pellet for evaluating biocompatibility of Ti, Ti-6Al-4V alloy (the most widely used alloy) and Ti-29Nb-13Ta-4.6Zr alloy. The DBM pellet made of mouse long bones was implanted on the dorsal muscle of mice under ether anesthesia. After the DBM pellet had been implanted for 4 weeks, the expression of mRNA for osteoblastic and osteoclastic phenotypes and mineralization were observed, suggesting that the DBM could heterotopically induce %%%bone%%%. The DBM pellet combined with a disk of Ti, Ti-6Al-4V alloy and Ti-29Nb-13Ta-4.6Zr alloy was implanted in the mouse in the same way. Four weeks after the implantation, the calcium contents accumulated in the DBM pellet with Ti, Ti-6Al-4V alloy and Ti-29Nb-13Ta-4.6Zr alloy were 36.68.0 mu g, 50.4 13.3 mu g and 75.6 16.9 mu g, respectively. A significant difference was observed between Ti and Ti-29Nb-13Ta-4.6Zr alloy ($p<0.05$). This result seemed to suggest the increase of the mineralization in DBM-induced heterotopic %%%bone%%% by Ti-29Nb-13Ta-4.6Zr alloy, because Ti particles showed no toxicities in mouse osteoblastic cells, in mouse %%%bone%%% marrow cells, and in %%%isolated%%% rabbit osteoclasts. These findings suggested that Ti-29Nb-13Ta-4.6Zr alloy might be a higher biocompatible material with %%%bone%%% tissue, and showed that the heterotopic %%%bone%%% induced by the DBM pellet in mice could be a simple and useful method for evaluating biocompatibility of titanium alloys.

2/7/248 (Item 5 from file: 73)
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0077177294 EMBASE No: 1999085904
Role of morphogenetic proteins in skeletal tissue engineering and regeneration
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Nature Biotechnology (Nat. Biotechnol.) (United States) March 31, 1998 , 16/3 (247-252)
CODEN: NABIF ISSN: 10870156
DOCUMENT TYPE: Journal; Review RECORD TYPE: Abstract
LANGUAGE: English SUMMARY LANGUAGE: English
NUMBER OF REFERENCES: 66

Morphogenesis is the developmental cascade of pattern formation and body plan establishment, culminating in the adult form. It has formed the basis for the emerging discipline of tissue engineering, which uses principles of molecular developmental biology and morphogenesis gleamed through studies on inductive signals, responding stem cells, and the extracellular matrix to design and construct spare parts that restore function to the human body. Among the many organs in the body, %%%bone%%% has considerable powers for regeneration and is prototype model for tissue engineering. Implantation of %%%demineralized%%% %%%bone%%% matrix into subcutaneous sites results in local %%%bone%%% induction. This model mimics sequential limb morphogenesis and has permitted the %%%isolation%%% of %%%bone%%% morphogens, such as %%%bone%%% morphogenetic proteins (BMPs), from %%%demineralized%%% adult %%%bone%%% matrix. BMPs initiate, promote, and maintain chondrogenesis and osteogenesis, but are also involved in the morphogenesis of organs other than %%%bone%%%. The symbiosis of the mechanisms underlying %%%bone%%% induction and differentiation is critical for tissue engineering and is governed by both biomechanics (physical forces) and context (microenvironment/extracellular matrix), which can be duplicated by biomimetic biomaterials such as collagens, hydroxyapatite, proteoglycans, and cell adhesion glycoproteins, including fibronectins and laminin. Rules of tissue architecture elucidated in %%%bone%%% morphogenesis may provide insights into tissue engineering and be universally applicable for all organs/tissues, including bones and joints.

2/7/249 (Item 6 from file: 73)
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0076252337 EMBASE No: 1995300263
Biological factors of %%%bone%%% remodeling: Clinical use of BMP (%%%Bone%%% morphogenetic protein)
FATTORI BIOLOGICI NEL RIMODELLARNENTO OSSEO: APPLICAZIONI CLINICHE DI BMP
(%%%BONE%%% MORPHOGENETIC PROTEIN)
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Rivista Italiana di Chirurgia Plastica (RIV. ITAL. CHIR. PLAST.) (Italy) October 17, 1995, 27/3 (281-287)
CODEN: RIPLD ISSN: 03912221
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: Italian SUMMARY LANGUAGE: English; Italian

Biological factors of %%%bone%%% remodeling: clinical use of BMP (%%%Bone%%% morphogenetic Protein) Over the past few years it has become evident that formation of new %%%bone%%% matrix can be obtained through both systemic and local factors capable of inducing proliferation and differentiation of mesenchymal undifferentiated cells. This, although not in contrast with the theory of physiological %%%bone%%% remodeling, has opened new prospects of therapy. Possible mediators of such processes are currently being studied. In particular, BMP seems promising and its activity has been proven both in vitro and in vivo. BMP is a low weight glycoprotein, is not species-specific, is found in the organic matrix of decalcified bones and contains mainly aspartic and glutamic acids, glycine and serine. The %%%bone%%% formation it induces is similar to that of the foetus. Its action is due to genetic 'activation' of mesenchymal cells which proliferate and differentiate into osteoblasts. Such cells can normally be found in perivascular connective tissue and can differentiate into osteoblasts if induced. The Authors report their experience in the use of %%%demineralized%%% %%%bone%%% powder, which contains EMP, to fill both congenital and acquired %%%bone%%% gaps. Preliminary results seem to show that induction of %%%bone%%% formation is more evident in young patients whose growth is still in progress and who are therefore more susceptible. Recent research on BMP aim at: - extraction of the %%%purified%%% BMP fraction; - disclosure of its aminoacid sequence; - evaluation of %%%bone%%% remodeling with BMP and/or other growth factors.

2/7/250 (Item 7 from file: 73)
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0076067392 EMBASE No: 1995109348
%%%Bone%%% morphogenetic proteins, %%%bone%%% marrow stromal cells, and mesenchymal stem cells: Maureen Owen revisited
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Clinical Orthopaedics and Related Research (CLIN. ORTHOP. RELAT. RES.) (United States) April 19, 1995, -/313 (115-119)
CODEN: CORTB ISSN: 0009921X
DOCUMENT TYPE: Journal; Conference Paper RECORD TYPE: Abstract
LANGUAGE: English SUMMARY LANGUAGE: English

In postnatal mammals, there are persistent molecular signals and responding cells in %%%bone%%% to initiate osteogenesis and repair in response to trauma. The responding osteogenic precursor cells are of 2 categories: determined and inducible. The latter can be induced by %%%demineralized%%% %%%bone%%% matrix to form %%%bone%%%. %%%Demineralized%%% %%%bone%%% matrix consists of extracellular matrix and tightly associated %%%bone%%% morphogenetic proteins. The genes for %%%bone%%% morphogenetic proteins have been cloned, the recombinant proteins have been expressed, and currently their mechanism of action is being explored. %%%Bone%%% morphogenetic proteins are pleiotropic initiators of inducible osteogenic precursor cells. %%%Bone%%% morphogenetic proteins govern the 3 key steps in the osteogenic cascade: chemotaxis, mitosis, and differentiation. The receptors for %%%bone%%% morphogenetic proteins have been cloned and expressed and consist of 2 classes, Types I and II, that are membrane bound serine/threonine protein kinases. %%%Bone%%% morphogenetic proteins bind to extracellular matrix and their collaborative action on osteogenic cells culminates in the terminal differentiation of the osteoblast-osteocyte continuum. %%%Bone%%% morphogenetic proteins are currently on the threshold for clinical applications.

2/7/251 (Item 8 from file: 73)
DIALOG(R)File 73:EMBASE
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0075062727 EMBASE No: 1992214400
The %%%bone%%% morphogenetic protein family and osteogenesis
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Molecular Reproduction and Development (MOL. REPROD. DEV.) (United States) July 24, 1992. 32/2 (160-167)
CODEN: MREDE ISSN: 1040452X
DOCUMENT TYPE: Journal; Conference Paper RECORD TYPE: Abstract
LANGUAGE: English SUMMARY LANGUAGE: English

The BMPs (%%%bone%%% morphogenetic proteins) are a group of related proteins originally identified by their presence in %%%bone%%%-inductive extracts of %%%demineralized%%% %%%bone%%%. By molecular cloning, at least six related members of this family have been identified and are called BMP-2 through BMP-7. These molecules are part of the TGF-beta superfamily, based on primary amino acid sequence homology, including the absolute conservation of seven cysteine residues between the TGF-betas and the BMPs. The BMPs can be divided into subgroups with BMP-2 and BMP-4 being 92% identical, and BMP-5, BMP-6, and BMP-7 being an average of about 80% identical. To examine the individual activities of these molecules, we are producing each BMP in a mammalian expression system. In this system, each BMP is synthesized as a precursor peptide, which is glycosylated, processed to the mature peptide, and secreted as a homodimer. These reagents have been used to demonstrate that single molecules, such as BMP-2, are capable of inducing the formation of new cartilage and %%%bone%%% when implanted ectopically in a rodent assay system. Whether each of the BMPs possesses the same inductive activities in an animal is the subject of ongoing research. Based on the chondrogenic and osteogenic abilities of the BMPs in the adult animal, the expression of the mRNAs for the BMPs has been examined in the development of the embryonic skeleton by in situ hybridization. These studies demonstrate that the BMP mRNAs are spatially and temporally expressed appropriately for the proteins involved in the induction and development of cartilage and %%%bone%%% in the embryonic limb bud. Furthermore, primary preparations of limb bud cells respond to BMP-2, as do several cell lines of the osteoblastic lineage. In addition to expression in the skeletal system, various of the BMP mRNAs are expressed in distinct tissues, suggesting additional roles during development.

2/7/252 (Item 9 from file: 73)
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0075041364 EMBASE No: 1992193037
Localization of malachite green positive lipids in the matrix of %%%bone%%% nodule formed in vitro
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Calcified Tissue International (CALCIF. TISSUE INT.) (United States) July 7, 1992. 50/3 (273-282)
CODEN: CTIND ISSN: 0171967X
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English SUMMARY LANGUAGE: English

An electron histochemical study was carried out on %%%bone%%% nodules formed in vitro in collagenase-released calvarial cells in order to visualize the lipid components of the extracellular matrix (EM). The malachite green aldehyde fixative technique, which allows both preservation and staining of some phospholipids of the extracellular matrix, was used. Controls were performed on sections %%%demineralized%%%, and then submitted to lipid extraction with a chloroform-methanol mixture (2/1 v/v) and to glycosaminoglycans digestion with 0.5% bovine testicular hyaluronidase to verify specificity for lipid staining. This allowed us to visualize the lipids (1) in the osteoid as granules associated to ribbon-like structures connected to the collagen fibers, (2) as electron-dense deposits seen as dots on the outer surface membrane of the matrix vesicles, and (3) in the mineralized matrix as roundish patches formed of needle-shaped materials and at the mineralization front as individual ones. This study demonstrated that at the EM level, the lipids are present in the osteoid at locations very similar to what have been observed for the glycosaminoglycans, and in the mineralized matrix as components of the crystal ghosts.

2/7/253 (Item 10 from file: 73)
DIALOG(R)File 73:EMBASE
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0074457283 EMBASE No: 1990356849
Gene expression during endochondral %%%bone%%% development: Evidence for coordinate expression of transforming growth factor beta SUB 1 and collagen type I
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Journal of Cellular Biochemistry (J. CELL. BIOCHEM.) (United States) November 29, 1990. 44/2 (81-91)
CODEN: JCEBD ISSN: 07302312
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English SUMMARY LANGUAGE: English

Subcutaneous implantation of %%%demineralized%%% %%%bone%%% particles (DBP) into rats induces the formation of a %%%bone%%% ossicle by a tightly controlled sequence of chondro- and osteo-inductive events which are directly comparable to those which occur in normal endochondral %%%bone%%% development. Although the morphological and biochemical sequence associated with endochondral %%%bone%%% formation in this model has been well characterized, to date little information is available as to the gene regulation by which these events occur. To examine the expression of genes in this system, RNA was %%%isolated%%% from implants every 2 days over a time course spanning 3 to 19 days after implantation of DBP into rats. Cellular levels of mRNA transcripts of cell-growth-regulated and tissue-specific genes were examined by slot blot analysis and compared to the morphological changes occurring during formation of the ossicle. Analysis of the mRNA levels of histone H4 and c-myc, markers of proliferative activity, revealed several periods of actively proliferating cells, corresponding to 1) production of fibroprogenitor cells (day 3), 2) onset of %%%bone%%% formation (day 9), and 3) formation of %%%bone%%% marrow (day 19). The mRNA levels of collagen type II, a phenotypic marker of cartilage, peaked between days 7 and 9 post-implantation, corresponding to the appearance of chondrocytes in the implant, and rapidly declined on day 11 (to 5% of maximum value) when %%%bone%%% formation was observed. The peak mRNA levels of collagen type I, found in fibroblasts and osteoblasts, occurred first with the onset of %%%bone%%% formation (days 7-10) and again during formation of %%%bone%%% marrow (day 19). This study has demonstrated that the temporal patterns of mRNA expression of cartilage type II and %%%bone%%% type I collagens coincide with the morphological sequence in this model of endochondral %%%bone%%% formation. Further, the mRNA levels of transforming growth factor beta SUB 1 (TGFbeta) were compared to those of collagen types I and II; a direct temporal correlation of TGFbeta mRNA levels with that of collagen type I was found throughout the developmental time course. This observation of a tightly coupled relationship between TGFbeta and type I collagen mRNA levels is consistent with a functional role for TGFbeta in extracellular matrix production during in vivo %%%bone%%% formation.

2/7/254 (Item 11 from file: 73)
DIALOG(R)File 73:EMBASE
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0074407276 EMBASE No: 1990306842
Radiation-sterilized insoluble collagenous %%%bone%%% matrix is a functional carrier of osteogenin for %%%bone%%% induction
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Calcified Tissue International (CALCIF. TISSUE INT.) (United States)
November 1, 1990, 47/3 (183-185)
CODEN: CTIND ISSN: 0171967X
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English SUMMARY LANGUAGE: English

The influence of gamma radiation on the role of the collagenous substratum as a carrier for proteins which cause %%%bone%%% induction was examined. Osteoinductive %%%demineralized%%% %%%bone%%% matrix was extracted by 4 M guanidinium hydrochloride. The insoluble collagenous %%%bone%%% matrix (ICBM) obtained was not osteoinductive; however, when reconstituted with partially %%%purified%%% osteogenin, %%%bone%%% induction was restored. In order to apply the principle of %%%bone%%% induction to clinical use, methods of sterilization must be optimized to maintain the osteoinductive activity of %%%bone%%% allografts. The inactive substratum was irradiated and reconstituted with an active, partially %%%purified%%% %%%bone%%% extract and bioassayed. Irradiation of the ICBM by a Cobalt 60 source at a dose of 1 and 3 Mrads had no deleterious effect on the functional role of the substratum.

2/7/255 (Item 12 from file: 73)
DIALOG(R)File 73:EMBASE
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0073123798 EMBASE No: 1986157832
The organic matrix of the skeletal spicule of sea urchin embryos
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Journal of Cell Biology (J. CELL BIOL.) (United States) August 13, 1986, 102/5 (1878-1886)
CODEN: JCLBA ISSN: 00219525
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English

The micromeres that arise at the fourth cell division in developing sea urchin embryos give rise to primary mesenchyme, which in turn differentiates and produces calcareous endoskeletal spicules. These spicules have been %%%isolated%%% and %%%purified%%% from pluteus larvae by washing in combinations of ionic and non-ionic detergents followed by brief exposure to sodium hypochlorite. The spicules may be %%%demineralized%%% and the integral matrix dissolves. The matrix is composed of a limited number of glycoproteins rich in aspx, glux, gly, ser, and ala, a composition not unlike that found in matrix proteins of biomineralized tissues of molluscs, sponges, and arthropods. There is no evidence for collagen as a component of the matrix. The matrix contains N-linked glycoproteins of the complex type. The matrix arises primarily from proteins synthesized from late gastrulation onward, during the time that spicule deposition occurs. The mixture of proteins binds calcium and is an effective immunogen. Electrophoresis of the glycoproteins on SDS-containing acrylamide gels, followed by blotting and immunocytochemical detection, reveals major components of ~ 47, 50, 57, and 64 kD, and several minor components. These same components may be detected with silver staining or fluorography of amino acid-labeled proteins. In addition to providing convenient molecular marker for the study of the development of the micromere lineage, the spicule matrix glycoproteins provide an interesting system for investigations in biomineralization.

2/7/256 (Item 13 from file: 73)
DIALOG(R)File 73:EMBASE
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0072775965 EMBASE No: 1984006381
Morphology of the organic matrix of the spicule of the sea urchin larva
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Experimental Cell Research (EXP. CELL RES.) (United States) December 1, 1983, 148/1 (249-253)
CODEN: ECREA ISSN: 00144827
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English

The morphology of the organic matrix of the skeletal spicule of the sea urchin pluteus larva has been analyzed by light and electron microscopy. %%%Purified%%% %%%isolated%%% spicules can be %%%demineralized%%%, and they
reveal lamellae of an irregular fibrillar nature with overall outlines similar to the shape of the intact spicule. Sections through the spicule show the fibrous lamella is probably composed of interconnected concentric sleeves.

2/7/257 (Item 14 from file: 73)
DIALOG(R)File 73:EMBASE
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0071276872 EMBASE No: 1979008823
The insoluble fraction %%%isolated%%% after digestion of %%%demineralized%%% human dentine matrix with collagenase
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Archives of Oral Biology (ARCH. ORAL BIOL.) (United Kingdom) December 1, 1978, 23/6 (511-513)
CODEN: AOBIA ISSN: 00039969
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English

Human dentine was %%%demineralized%%% and exhaustively extracted with EDTA after which the insoluble matrix was digested with collagenase in a dialysis sac. The insoluble residue after digestion was %%%isolated%%% and extracted with 8 M urea which dissolved much of the material. Analysis of this extract and of a fraction obtained by chromatography on DEAE-cellulose indicated that the insoluble collagenase-released fraction mainly consisted of an unknown glycoprotein. Small amounts of a further component were obtained by extraction of the urea-insoluble residue with urea-mercaptoethanol solution.

2/7/258 (Item 15 from file: 73)
DIALOG(R)File 73:EMBASE
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0071213021 EMBASE No: 1978356218
Formation of cartilage by non-chondrogenic cell types
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Developmental Biology (DEV. BIOL.) (United States) August 31, 1978, 64/1 (99-117)
CODEN: DEBIA ISSN: 00121606

DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English

Freshly excised embryonic rat skeletal muscle has been shown to form hyaline cartilage when organ cultured upon %%%demineralized%%% rat %%%bone%%% (%%%bone%%% matrix). Since skeletal muscle is composed of fibrous connective tissue (C.T.) as well as muscle cells, the cartilage could arise from either of these sources. The object of this study was to determine whether cartilage arose from fibrous connective tissue or muscle cells, or both, and whether the ability to form cartilage is limited to tissues derived from somatic mesoderm. Control experiments demonstrated that 19-day embryonic rat skeletal muscle formed cartilage when organ cultured on %%%bone%%% matrix after dissociation and cultivation in vitro, and that 11-day embryonic chick muscle also formed cartilage, although less reproducibly (3 out of 10 cases). Fibroblasts and skeletal muscle were cloned from similar suspensions of dissociated muscle in order to test these %%%purified%%% cell types. Dermis, vascular tissue, and tendons were mechanically removed prior to dissociation in order to eliminate fibroblasts from contaminant sources. Cloned fibroblasts, derived from rat skeletal muscle, formed cartilage in three out of three cases. It was not possible to clone sufficient rat skeletal muscle to place an aggregate onto %%%bone%%% matrix. An aggregate of several hundred chick skeletal muscle clones formed cartilage on %%%bone%%% matrix. The freshly excised C.T. capsules of embryonic chick thyroid and lung were tested for the ability to form cartilage as nonskeletal C.T. derivatives. The epithelial rudiments of thyroid and lung were also tested as endodermal derivatives. Chick cornea was similarly tested as an ectodermal derivative. Of these tissues, only the C.T. capsules formed cartilage. The results demonstrate that various C.T. cell types may alter their phenotype well after that stage at which their differentiation is thought to be stabilized, and that the ability to differentiate as cartilage may be common to all C.T. cells. The option of differentiating along a certain variety of pathways may depend more upon local conditions than on a predetermined pattern.

2/7/259 (Item 16 from file: 73)
DIALOG(R)File 73:EMBASE
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0070569770 EMBASE No: 1976156667
Components of the organic matrices of %%%bone%%% and dentine %%%isolated%%% only after digestion with collagenase
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Archives of Oral Biology (ARCH. ORAL BIOL.) December 1, 1975, 20/3 (211-216)
CODEN: AOBIA ISSN: 00039969
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English

Bovine %%%bone%%% and human dentine were %%%demineralized%%% and exhaustively extracted with EDTA, then extracted with 8 M urea and pH 5 citrate buffer. The insoluble matrices were then digested with collagenase and the final non dialysable, non collagenous fractions separated by chromatography on DEAE cellulose followed by gel filtration on Sephadex G 100. The collagenase released fraction (CRF) from bovine %%%bone%%% was composed mainly of two fractions; a sialoprotein (CRS) and a component containing over 90 per cent protein (CRP). Dentine collagenase released material consisted almost entirely of a single protein component the composition of which was closely similar to that of %%%bone%%% CRP.

2/7/260 (Item 17 from file: 73)
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0070299781 EMBASE No: 1975083568
Substrata prepared from %%%bone%%% matrix for chondrogenesis in tissue culture
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CORRESP. AUTHOR AFFIL: Los Angeles Bone Res. Lab., UCLA Cent. Hlth Sci., Los Angeles, Calif. 90024, United States

Journal of Cell Biology (J. CELL BIOL.) December 1, 1974, 62/2 (510-519)
CODEN: JCLBA ISSN: 00219525
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English

Cartilage developed from muscle mesenchymal cell outgrowths into old vascular channels and artifactual crevices cut in the substratum of undenatured %%%bone%%% matrix. An overt expression of chondrogenetic determination, observed in SUP 35S autoradiographs and electron micrographs, occurred on about the 7th day of culture in medium CMRL 1066. Large deposits of cartilage developed upon a substratum of whole %%%bone%%% matrix, or of insoluble %%%bone%%% gelatin (BMG), or BMG partially digested with collagenase. Little or no cartilage differentiated after autolytic digestion of matrix incubated in phosphate buffer pH 7.4 at 37(deg)C for 4 days. Matrix heated to 55(deg)C before incubation in buffer was less autolyzed and promoted cartilage differentiation. Small %%%isolated%%% patches of cartilage differentiated from outgrowths on to pulverized matrix but little or no cartilage grew on lathyritic %%%demineralized%%% or undemineralized normal %%%bone%%%, or on BMG partially digested with trypsin. No cartilage was ever obtained from muscle mesenchymal cell outgrowths on to millipore membrane. A 20% O SUB 2 saturation produced cartilage cell hypertrophy and vesiculation, and 60% O SUB 2 was toxic for mesenchymal cells in culture. The number of cells or the yields of new cartilage were greater from mesenchymal cell outgrowths from muscle than from %%%bone%%% marrow, thymus, spleen, or skin.

2/7/261 (Item 18 from file: 73)
DIALOG(R)File 73:EMBASE
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0070084344 EMBASE No: 1974084427
%%%isolation%%% of tissue collagenase from homogenates of embryonic chick bones
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Dept. Orthop. Surg., Harvard Med. Sch., Child. Hosp. Med. Cent., Boston, Mass. 02115, United States
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Biochemical and Biophysical Research Communications (BIOCHEM. BIOPHYS. RES. COMMUN.) December 1, 1973, 53/4 (1102-1108)
CODEN: BBRCA ISSN: 0006291X
DOCUMENT TYPE: Journal; Article RECORD TYPE: Abstract
LANGUAGE: English

An enzyme capable of digesting undenatured collagen in solution and in the soli state as reconstituted collagen fibrils at neutral pH was extracted from %%%demineralized%%% embryonic chick %%%bone%%% homogenates in 1.0 M NaCl at neutral pH. The enzyme could be dissociated from the small amount of collagen which was also solubilized in 1.0 M NaCl by the serial use of Diaflo XM 300 and PM 10 membranes, which procedures also concentrated the enzyme. The enzymatic activity was inhibited by EDTA, cysteine and horse serum, and was enhanced by the addition of heparin.
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    $83.27  Estimated cost File73
        OneSearch, 4 files,  6.262 DialUnits FileOS
    $1.06  TELNET
  $257.50  Estimated cost this search
  $268.07  Estimated total session cost   9.526 DialUnits
Logoff: level 05.21.01 D  13:37:30
```